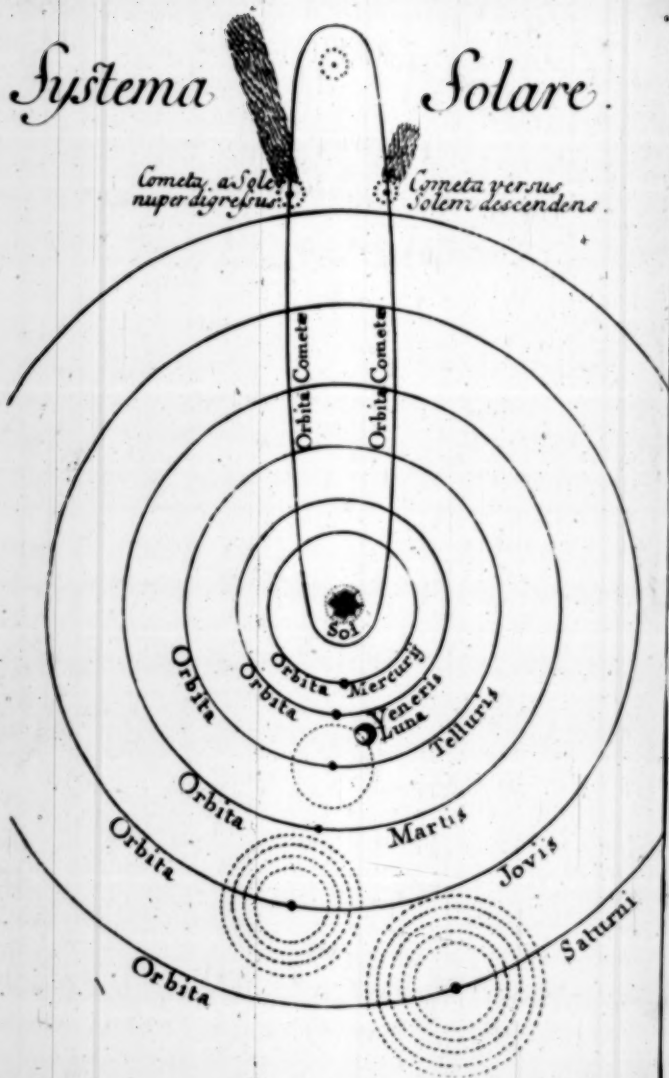


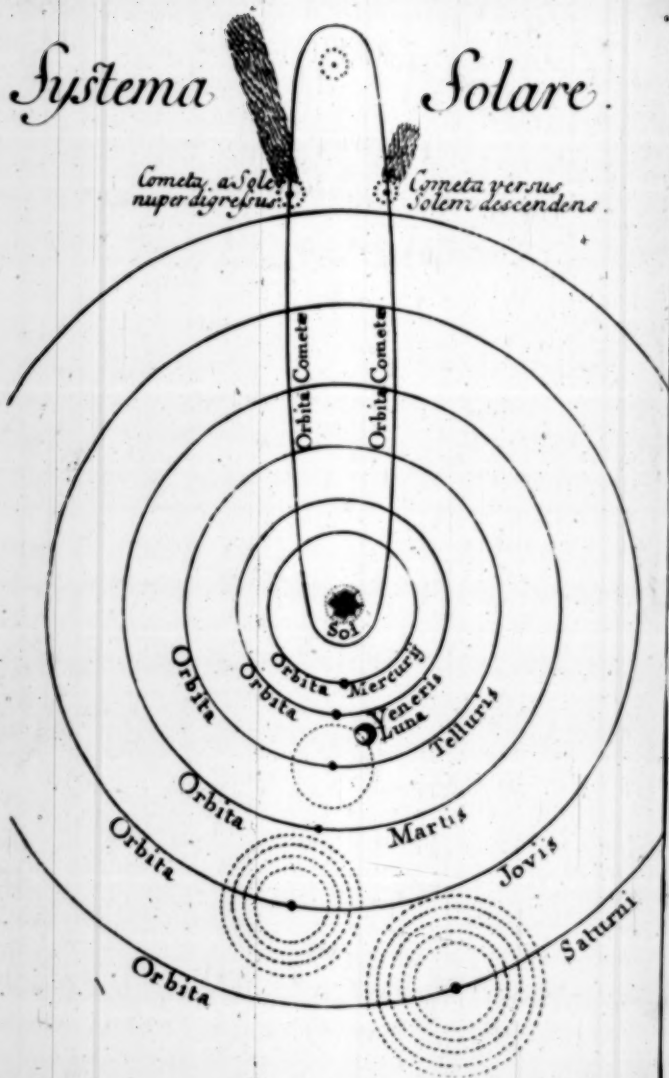
Systema

Solare.



Systema

Solare.



A NEW
THEORY
OF THE
EARTH,

From its ORIGINAL, to the
CONSUMMATION of all Things.

WHEREIN
The CREATION of the World in Six Days,
The Universal DELUGE,
And the General CONFLAGRATION,
As laid down in the Holy Scriptures,
Are shewn to be perfectly agreeable to
REASON and PHILOSOPHY.

With a large Introductory Discourse concerning the Genuine Nature, Stile, and Extent of the *Mosaic* History of the CREATION.

By WILLIAM WHISTON, M. A.
Chaplain to the Right Reverend Father in God,
JOHN Lord Bishop of NORWICH, and
Fellow of *Clare-Hall* in *Cambridge*.

L O N D O N:

Printed by R. Roberts, for Benj. Tooke at the
Middle-Temple-Gate in *Fleet-street*. MDCXCVI.

AMERICAN

THEORY

RECEIVED

BD

501

W58

SUMMO VIRO ISAACO NEW-
TON, Apud Londinenses Socie-
tatis Regalis, Apud Cantabrigienses
suos Collegij S. S. Trinitatis Socio
Dignissimo; Matheseos Professori
Lucafrano longè Celeberrimo; nec-
non Regio Nummorum Culorum
Præfecto; Reipublicæ, quoquò pa-
ter, Literariæ Ornamento; Seculi,
Gentis, Academiæ egregio Decorì;
Orbis Philosophici Delicijs. Qui rem
præsertim Mathematicam eousque Ex-
coluit, Adauxit, Dilatavit, ut ipsam
Physicam intra pomeria sua com-
plecti, & Mundi Systema, conatu in-
audito, ditioni suæ subicere tandem
aliquando audeat. Quem Morum
Candor & Modestia; Quem Sagax
animus & penetrans; Quem assidui
Labores, indefessæ Vigiliæ, Industria
incredibilis promovendis veræ ac so-
lidæ Sapientiæ studijs unicè dicata;
Quem Rerum Divinarum Humana-
rumq; hoc est Universæ Philosophiæ,
peritia

peritia planè singularis ; Quem de-
mum PHILOSOPHIÆ NATURA-
LIS PRINCIPIA MATHEMATI-
CA, auro contrà æstimanda, & mor-
talibus vix aut ne vix propalanda te-
mere, Ultimæ posteritati æternùm
Commendabunt.

Exiguum hocce Tentaminis Philo-
sophici Spicilegium, è Messe NEW-
TONIANA primitus sublectum ;
Subsidij, Consilij, Auspicijs potissi-
mùm NEWTONIANIS acceptum,
uti pat est, referendum ratus, Totum
hoc, Qualecunque sit, NEWTONI
nomina, in omne ævum perennaturo,
Nuncupandum ; &, in Grati Animi
MUNIFICENTIA, Consecrandum censuit Gu-
lielmus Whiston. 17. Kal. Jun. A. D.
1696.

ADIS

A
DISCOURSE
Concerning the
Nature, Stile, and Extent
OF THE
MOSAICK HISTORY
OF THE
CREATION.



T being no inconsiderable part of the ensuing Theory, to account for the Creation of the World, agreeable to the description thereof in the Book of *Genesis*, it cannot but be very necessary in this place, to discourse of the nature of that Sacred History, the Stile in which it is Writ, and how far it is to be Extended. The misunderstanding of which points has been, I think, the principal occasion of those perplexities and contrarieties into which Men have run with relation to it; while some have adher'd to the common and vulgar, tho' less rational Exposition, without any

B

con-

Of the Mosaick Creation.

consideration of Nature, Reason, Philosophy, or just *Decorum* in the several parts of it: And others, on the contrary, have been so sensible of the wildness and unreasonableness of *That*, that they have ventur'd to exclude it from any just sense at all; asserting it to be a meer Popular, Parabolick, or Mythological relation; in which the plain Letter is no more to be accounted for or believ'd, than the fabulous representations of *Aesop*, or at best than the mystical Parables of our Saviour. Of what mischievous consequence this latter is commonly esteem'd, I need not say; a late excellent Author, who thought it absolutely necessary to be introduc'd, having felt reflections sufficiently severe, and seen effects sufficiently mischievous of such an Interpretation. And how unworthy of God, how incoherent and absurd the former Exposition is in it self, and must be esteem'd by free and inquisitive Thinkers, 'tis not difficult to make appear to any impartial Man, and shall in this Discourse be particularly attempted. Indeed I cannot but imagine that, as those who plead for the Mythological sense, do it only because they suppose it impossible to give a commodious and rational scheme of it on any other Hypothesis; and therefore will easily and readily embrace any more literal Interpretation which shall agree to the Divine Attributes, the Reason of their own Minds, and the true System of the World; so I think those who, notwithstanding its apparent incongruities, adhere to the vulgar Exposition, will have great reason to encourage, and rest satisfy'd in such an account, as shall at once keep sufficiently close to the Letter of *Moses*, and yet be far from allowing what contradicts the Divine Wisdom, Common Reason, or Philosophick

Philosophick Deductions: to both which therefore, I persuade my self this new attempt ought not to be unacceptable.

But because the principal difficulty is likely to arise from the prejudices and prepossessions of the latter, and from the vulgar and common notions already fix'd in the Minds of most Men, relating to this *Mosaick Creation*; I shall in this place chiefly have a respect to them, and endeavour to evince, That the notions they have entertain'd of the Nature, Stile, and Extent of the Creation of the World in six days, are false, precarious, and no less contrary to the Holy Scriptures themselves, than to sound Reason and true Philosophy. The Proposition therefore which shall be the subject of this Dissertation, and includes the whole point before us, shall be this: *The Mosaick Creation is not a Nice and Philosophical account of the Origin of All Things; but an Historical and True Representation of the formation of our single Earth out of a confused Chaos, and of the successive and visible changes thereof each day, till it became the habitation of Mankind.*

That this Proposition is exactly agreeable to that Account, which in the following Theory is given of this Creation, will be evident upon the perusal thereof; and that the same Proposition is alike agreeable to the Design and Stile of the Sacred Penman in the first Chapter of *Genesis*, is what I am now to make appear; and that I shall endeavour to do by the following Arguments; which tho' they might have been distinguish'd, and suited to the several branches of this Assertion, yet for ease I shall wave that niceness, and set them down indifferently in that order they were put into by my own thoughts, before I intended to adapt them to the just form

of the foregoing Proposition ; Strength of Reasoning, more than Exactness of Composition, being the aim of the Author in this whole Theory : And if he be found to go upon solid grounds, he hopes the Reader will never the less embrace the Conclusions, because of the inaccuracy of the Style, or harshness of the Periods ; which wholly to have avoided, he freely owns, would to him have been more tedious and operose than the Work it self ; and so he hopes 'twill not be expected from him by the Inquisitive Reader : Which Apology once for all he desires may be accepted, and call'd to mind whenever (as too frequently it will) there shall be occasion in the following Pages.

Gen. i. 1. I. The very first words of *Moses* plainly imply, that the Production of all the World out of nothing, which we usually stile Creation, was prece-
 Gen. i. 1. daneous to the Six days Works, given an account of in the same chapter. *In the Beginning God Created the Heaven and the Earth*, says the Scripture ; which is, as I take it, a Preface or Introduction to the following account, and may be thus paraphras'd : " Altho' that History of
 " the Origin of the World which shall now be
 " given you, do not extend any farther, as will
 " appear presently, than that Earth we live up-
 " on, with those Bodies which peculiarly be-
 " long to it ; and so the rest of the Universe be
 " not at all directly concern'd therein ; and al-
 " tho' the same History will not reach to the
 " Creation of the matter, but only Production
 " of the form, and disposition of the Earth it
 " self : Yet, to prevent any misunderstanding,
 " and obviate any ill effects of a perfect silence
 " touching these things, I am oblig'd, by the
 " Divine

“ Divine Command, to assure you, That the
 “ Original of all Beings whatsoever, was pri-
 “ marily owing to that same God of *Israel*,
 “ whose Works I am going to relate ; and that
 “ not only this Earth, and all its Bodies, but the
 “ vast Frame of Universal Nature, was by him
 “ at first Created out of Nothing, and dispos’d
 “ into those several Systems which now are ex-
 “ tant, and make up what in the largest sense
 “ is stil’d Heaven and Earth, or the whole
 “ Word.

This sense of the Words is allow’d by our
 late Excellent Commentatour, the Right Re-
 verend the Lord Bishop of *Ely*; (whose Senti-
 ments cannot but be justly valued by all who
 are conversant in his Expositions of the Holy
 Scriptures) and is I think clearly confirm’d by
 the following words; *And the Earth was with-*
out Form and Void, and Darknes was upon the Face
of the Deep, and the Spirit of God moved on the
Face of the Waters. Where ’tis clear, that as soon
 as the Holy Writer descends to the Description
 of the Chaos, and the commencing of the Six
 Days Creation, he mentions not a word of any
 Production out of Nothing (before suppos’d and
 asserted to have been past and done, *In the Be-*
ginning) he omits, and thereby evidently ex-
 cludes that Heaven, or those Superior Systems
 of the World already spoken of, from any place
 therein, and by the whole coherence plainly con-
 fines the Narration following to the Earth alone
 with its dependencies. *Moses* does not say, as
 the common Expositors do, “ That just at the
 “ commencing of the Six Days Work, the
 “ Earth, and all the rest of the World was
 “ originally produc’d ; But that, When God
 “ had (formerly) created all the World, which

Gen. 1. 2.

“is usually distinguish’d into the Heaven and
 “the Earth, the latter of these, (the consideration whereof was alone pertinent to the
 “present design) at the time preceding the
 “Six Days Work, was in a Wild, Irregular,
 “and Dark condition; or such a perfect Chaos,
 “as nothing but the Power of God, and his
 “Spirit’s moving on, and influencing the same,
 “could ever have reduc’d into a habitable
 “World.

This is a very easie and natural account of this matter, and I think the most obvious and genuine signification of the words themselves: And were not Mens Minds too much prejudic’d with other apprehensions, this alone might be sufficient to limit their thoughts, and prevent their Enquiries after any Creation of Bodies out of nothing in the Six Days Work; and their stretching the same beyond the Earth, either to the whole System of things, as the most do; or indeed to the Solar System, with which others are more modestly contented in the case. Which two things once granted me, the Proposition we are now upon would soon be establish’d, and little farther labour become necessary.

But that I may give all possible satisfaction, and lay this Foundation firm, on which my Account of the *Mosaick* Creation is intirely superstructed; I shall more at large prove the same Truths, craving the Pardon of those Readers who are already satisfy’d in these matters, if I shall seem to them to insist too long on a plain case; as perhaps they may (and that I think very justly) esteem this to be.

And indeed, The prejudices of Men are here so great; their fears of a Philosophical Hypothesis

thesis so rooted; the attempts hitherto made have been so unsuccessful; and besides, the Honour of God in his Holy Word is so much concern'd; and the usual Expositions of this History of the Origin of Things is so poor, so jejune, so unbecoming the Penman, much more the primary Author of the same; that a large and full Discourse is but necessary; and tho' it should prove somewhat prolix, will be, 'tis hop'd, not improper; but as well serviceable to Religion as to Philosophy, by rescuing this Ancient, Venerable, and Sacred Account of the Origin of things, from such false and unwary Glosses as have been, and still are put upon it; as have rendred it, in the opinion of too many, an uncouth and incredible System, nay somewhat below some of those *Θεογονίαι* or *Κοσμογονίαι*, which the imperfect Traditions of the Heathen World enabled them to describe. To proceed therefore in the arguments before us, I affirm,

II. That the words here us'd of *Creating*, *Making*, or *Framing* of things, on which the main stress is laid; in the stile of Scripture are frequently of no larger importance than the Proposition we are upon does allow; and signify no more than the ordering, disposing, changing, or new modelling those Creatures which existed already, into a different, and sometimes perhaps a better, and more useful state than they were in before. I do not say this is the utmost, or only importance of these words; I have already allow'd, that *Creating*, in the first words of *Genesis*, includes Producing out of nothing; and I add, that in our common Creed, where in we profess our Faith in God the Father Almighty, *Maker of Heaven and Earth*; the words

are, agreeably to the extent of the Divine Power, and the nature of that profession, to be taken in the same large and comprehensive sense: and the like is to be said of many other places of the Holy Scripture. But then I observe withal, that the other more narrow and limited sense is very common and familiar in the Holy Writings; and therefore, where the subject matter and coherence requires it, as I think 'twill be evident it does in the present case, these words both may and ought to be taken in the same acceptation.

This signification of the two latter words *Make* and *Frame*, will, I suppose, be granted me by all; and that the same is as true of the other *Create*, the following Texts will sufficiently evince; and from the promiscuous use of them all, and others of a like importance, might however be very fairly suppos'd. If, says Moses, *the Lord make a new thing*, or *Create a Creature, and the Earth open her Mouth and swallow them up*. Where none can imagine any thing produc'd out of nothing, but only such an unusual and miraculous disposal of things as would at once demonstrate God's Vengeance against the Wicked, and his absolute Command over all Creatures. Thus God himself says, *I form the light and create darkness; I make peace and create evil; I the Lord do all these things*: Where the objects of the Divine Creation being not real and substantial Beings, could not be capable of a proper production out of nothing: Which also is the case in the verse immediately following, *Let righteousness spring up together; I the Lord have created it*. Thus also, says God by the same Prophet, *I create new Heavens and a new Earth*: which, tho' the very case before us, yet would
 only

Num. xvi.
30.

Isa. xlv. 7.

Jer. 8.

Ez. i. 17.

odly enough he expounded of an annihilation of the World, and a reproduction of it again. But what comes still more home to our purpose is, that in the very History of the Creation it self, the word Create, as well as Make, is us'd in the sense we contend for ; the very same things being ascrib'd to the Creating and Making Power of God, which are also describ'd as the regular offspring of the Earth and Seas : *God created great Whales, and every living Creature that moveth; which the waters brought forth abundantly after their kind. And God said, Let the Earth bring forth the living Creature after his kind, Cattel and creeping thing, and Beast of the Earth after his kind; and it was so: And God made the Beast of the Earth after his kind, and Cattel after their kind, and every thing that creepeth upon the Earth after his kind; and God saw that it was good.*

Gen. i. 21.

Gen. 1. 24, 25.

So that when the words made use of in the History of the Creation are there, and every where taken promiscuously ; when some of them are, by the confession of all, of no larger importance than the Proposition before us will admit ; and when, lastly, that word, of which the greatest doubt can arise, has been prov'd not only in other Texts of Scripture, but in the very History of which we are treating, to be of no more determinate signification than the rest, and alike capable of the sense we here put upon it ; I think 'tis a clear Case, that if no Argument can be drawn from such words for, yet neither can there justly be any against, that Proposition we are now upon.

III. Those synonymous Phrases, *The World* ; or *the Heavens*, and *the Earth*, under which the Object of the six days Creation is comprehended every

every where in Scripture, do not always denote the whole System of Beings; no nor any great and general Portion of them; but are in the Sacred Stile frequently, if not mostly, to be restrained to the terraqueous Globe with its dependances; and consequently both may, and if the subject matter require it, ought to be understood in such a restrained sense, and no other: That by these Phrases the *Mosaick Creation*, or six days work is usually understood, is evident every where in Scripture, as the following Texts will easily evince: *God who made the World, and all things therein. The Divine Abs^{ence} was in the World, and the World was made by Him, and the World knew Him not.* Hence those frequent expressions, *From the Foundation of the World, from the Beginning of the World, from the Creation of the World, and before the World was*; which, tho' capable of including more, must yet be allow'd to have generally a peculiar, nay sometimes a sole regard to the six days work, particularly stild by St. Mark, *The Beginning of the Creation which God created.*

In the same manner, and with the like frequency, the other Phrase *Heaven and Earth*, denote the same six days work also: *Thus the Heavens and the Earth were finished, and all the Host of them. These are the Generations of the Heavens and of the Earth when they were created, in the day that the Lord God made the Earth and the Heavens. In six days the Lord made Heaven and Earth, the Sea, and all that in them is, and rested the seventh day;* which being so express, I shall not need to look out for any other parallel places.

And that both the *World*; and *Heaven*, and *Earth*, signify the terraqueous Globe alone, with its Air or Atmosphere and other Appurtenances, without including the whole Universe, nay, or Solar

Acts xvii.

24. John

i 10. Mar.

xiii. 35. &

xxiv. 21.

& xxv. 34.

Luk. xi. 50.

Joh. xvii.

5, 24.

Rom. i. 20.

Eph. i. 4.

Heb. iv. 3.

& ix. 26.

1 Pet. i. 20.

Apoc. xiii.

8. & xvii.

8. Mark

xiii. 19.

Gen. ii. 1.

ver. 4.

Com-

mand. 4.

Solar System, also, (which yet I do not deny sometimes to be comprehended therein) the following Texts will sufficiently shew. Our Lord says of the Woman who poured the Oyntment on him, *Wheresoever this Gospel shall be preached in the whole World, there shall also this which this Woman hath done be told for a memorial of her.* His Charge and Commission to his Apostles was, *Go ye into all the World, and preach the Gospel to every Creature. The Tempter came to Jesus, and shew'd him all the Kingdoms of the World, and the Glory of them.* In all which places, no other than the habitable Earth can be understood: and 'tis still so frequent and natural for Men to use this manner of Speech in the same restrained Sense to this very day, that one may the less wonder at the Sacred Stile in this Case. But this word, *the World*, having not so much difficulty in it, nor being so much stood upon, as those which follow, *the Heavens and the Earth*, I shall no longer insist upon it, but proceed.

Mat. xxvi.

13.

Mark xvi.

15.

Mat. iv. 8.

And here, when the *World*, as a *totum integrale*, is divided into its two contradistinct Parts, *the Heavens and the Earth*, it will be said, That by such a Phrase or Enumeration of the Parts of the Universe, no less can be meant than the whole World in the largest acceptation; or however, more must be intended than the bare Earth, which is but one Member or Branch, and so certainly less than that whole of which it is a part.

In answer whereto, I freely confess, That the Heavens and the Earth do not seldom denote the intire Universe, an instance of which the first words of *Genesis* have already afforded us; but that they always do so, I have reason to deny. As the Signification of the *Earth* is known, and capable of no Ambiguity, so 'tis quite otherwise,

wife in the word *Heaven*, which in common use, and the sacred Authors, sometimes refers to the Seat of the Blessed, or the third Heaven; sometimes to the place of the Sun, Moon, and Stars; and otherwhiles is no farther to be extended than the Clouds, or the open *Expansum* about the Earth, where the Air, Atmosphere, Meteors, Clouds, and Volatils, have their abode. Instances of the two former Significations, were it pertinent to my present purpose, might easily be produc'd; but that not being so, I shall wave the same, and only prove the third and last Signification, namely, That by the Heavens is frequently understood nothing 'more than the Atmosphere of the Earth, with its appendant or contained Bodies.

Thus, *God made the Firmament, and divided the Waters which were under the Firmament, from the Waters which were above the Firmament; and it was so. And God called the Firmament, Heaven.* Which place is so express; and in the very History it self, which we are now about also, that it ought to be of peculiar force in the present case. Thus also the Builders of *Babel* said, *Go to, Let us build us a City, and a Tower, whose top may reach unto Heaven.* So mention is made of *Cities great and fenced up to Heaven.* The Clouds pass by the name of the *Clouds of Heaven*; nay, they are by the *Psalmist*, (agreeably to the Interposition of the *Expansum*, Firmament or Heaven on the second day of the Creation between the superior and inferior Waters) made as it were its farthest Boundaries and Limits; the Waters contain'd in them being call'd, *Waters which are above the Heavens.* The very Fowls, which still reside nearer to the Earth, are stil'd *the Fowls of Heaven*; and were originally appointed to *fly above the Earth*

Gen. i. 7, 8.

Cap. xi. 4.

Deut. ix. 1.

Mat. xxiv.

30.

& xxvi.

64.

Pl. cxlviii.

4.

Mat. viii.

20. & xiii.

31.

Earth

Earth in the open Firmament of Heaven. By all which places 'tis evident, That the word *Heaven* is commonly so far from including the Sun or Planetary *Chorus*, (much less the fix'd Stars, with all their immense Systems) that the Moon, our attending and neighbour Planet is not taken in: The utmost bounds of our *Atmosphere*, being so of this our *Heaven* also; which was the only Point which remain'd to be clear'd.

But here, before I proceed farther, I must take notice of a considerable Objection, which threatens to wrest this Argument out of my hands, and indeed to subvert the intire Foundation of the Proposition before us; and is, I freely own, the main difficulty in this whole matter; and 'tis this, That such a Sense of the words, *World*, and *Heaven*, and *Earth*, as has been pleaded for, whatever may be said in other cases, will yet by no means fit here, nor take in all the extent of the *Mosaick* Creation; because 'tis certain, that neither the *Light*, by whose Revolution Night and Day are distinguish'd, nor the Sun, Moon, and Stars, which are set in our Firmament, belong to our *Atmosphere*, or are contain'd within those Boundaries, within which we confine the present History; and 'tis equally certain that both of them belong to the *Mosaick* Creation, and are the first and fourth days works therein; and by consequence it may be said, the Subject of the six days Creation must be the whole System of the heavenly Bodies, or at least that particular one in which the Earth is, and is still the Solar System.

Now this Objection is in part already taken off by the Sense, in which the Production and Creation of things has been shewn to be frequently taken in the Holy Scriptures; whereby there

Gen. i.
20.

there appears to be no necessity of believing these Bodies to have been then brought into being, when they are first mention'd in the *Mosaick Creation*.

But because this is not meerly the chief, but only considerable Objection against the Proposition we are upon; because it seems to have been the principal occasion of men's Mistakes and Prejudices about this whole History; and because 'tis the single instance wherein this intire Theory, as far as I know, seems to recede from the obvious Letter of Scripture; 'twill be but proper to give it a particular review, and clear withal, not only this, but several other like Expressions and Passages in the Holy Scripture.

Now, in order to the giving what satisfaction I can in this Point; let it be consider'd, That the Light being not said to be created by *Moses*, its Original were without difficulty to be accounted for, if the other Point, the making of the Heavenly Bodies were once settled, which therefore is the sole remaining difficulty in the case before us. And that would be no harder, if the Translation of the Words of *Moses* were but amended, and the Verses hereto relating, read thus, *And God said; Let there be lights in the firmament of the Heaven, to divide the day from the night; and let them be for signs, and for seasons, and for days and years; and let them be for lights in the firmament of the Heaven, to give light upon the Earth, and it was so. And God having (before) made two great lights, the greater light to rule the day, and the lesser light to rule the night; and having (before) made the stars also, God set them in the firmament of Heaven to give light upon the Earth; &c.* or which is all one, *And God had (before) made two great lights, the greater light to rule the day, and the lesser light*

Gen. i. 14,
15, 16,
17.

light to rule the night; he had (before) made the stars also, and God set them in the firmament, &c. In which rendring, 'tis only changing the *perfectum* for the *plusquam perfectum*, and every thing is clear and easy, and the Objection vanishes of its own accord; the Creation of the heavenly Bodies being hereby assigned to a former time, and the Work of the fourth day no other than the placing them in our Firmament, according as the account hereafter to be given does require.

Now to prove this a fair and just Interpretation. (to omit the Creation of the Heavens and Heavenly Bodies already related before the six days work) 'tis only necessary to observe that the Hebrew Tongue having no *plusquam perfectum*, must and does express the Sense of it by the *perfectum*; and that accordingly, the particular circumstances of each place must alone determine when thereby the time present, and when that already past and gone, is to be understood. How many knots in the Scripture the omission of this Observation has left unsolv'd, and which being observ'd would be immediately untied, I shall not go about to enumerate, there being so many in the very History before us, of the Origin of the World, that I shall not go one jot farther for instances to confirm the before-mention'd Translation; and which, on the account of their agreement in place, will more forcibly plead for a like agreement in Sense also. On the seventh day God had ended his work which he had made, and he rested on the seventh day from all his work which he had made. — He had rested from all his work which God had created and made. — The Lord God had not caused it to rain on the Earth, and there had not been a man to till the Ground; but there had

Gen ii. 2.

ver. 3.

ver. 5, 6.

gone

ver. 7.

ver. 8.

ver. 9.

ver. 19.

gone up a mist from the Earth, and bad water'd the whole face of the ground; and the Lord God bad formed man of the dust of the ground, and bad breathed into his nostrils the breath of life. — And the Lord God bad planted a Garden eastward in Eden. — And out of the ground bad the Lord God made to grow every tree that is pleasant to the sight, and good for food. — And out of the ground the Lord God bad formed every beast of the field, and every fowl of the air. — In all which places the whole Context is so clear'd by this rendring, and so many strange Absurdities avoided, that there is, I think, all imaginable reason to acquiesce in it.

And tho' the fourth days work is among those other, where no such alteration need be made, in which therefore it may seem hard to allow of a single instance against the use in the precedent and subsequent Context in the first Chapter, yet the circumstances of that day being peculiar; the like mixture of the *perfectum* and *plusquam perfectum* being in the second Chapter, and in other places of Scripture to be observed; and a distinct work being still hereby preserv'd to that day, the placing the Sun, Moon, and Stars, in our Firmament, which otherwise is after a sort double; do all in good measure, take away the force of such Reasoning, and conspire to allow us that Interpretation before given, and thereby to secure the Proposition before us from that grand Objection which seemed capable of causing so great an obstruction in our course. But if any should be dissatisfied with this Answer, I shall, for their sakes, enter deeper into this matter; and, without any assistance from what has been already said, endeavour to establish the Proposition before us, and take away the foundation of the present difficulty.

And

And here I observe, That the Scripture all along accommodates its self to the vulgar Apprehensions of Men, with relation to such Points of Natural Philosophy as they were not able to comprehend; and in particular, with relation to the Site, Distance, Magnitude, Use, and Motions of the Heavenly Bodies. Tho' these be really very distinct, as well as distant from the Earth, with all its dependances; yet are they rarely, if ever, so consider'd in the Holy Scriptures. They are all along there represented as fiery Luminaries plac'd in our Atmosphere, and as much belonging to, and depending on the Earth as the Clouds, Meteors, or other Aerial *Phænomena*: And so 'tis no wonder that in the History before us, they are included among the rest of their Fellows, and come within the verge of the *Mosaick* Creation, notwithstanding its limits be no larger than we here assign thereto. In order to the accounting for which things, I shall,

(1.) Shew the truth of the Observation, in several instances from the Holy Scriptures.

(2.) Shew the rational Original and Occasion of such ways of speaking.

(3.) Explain what, according to my Notion, must be meant by the Creation or Production of these Heavenly Bodies in the *Mosaick* History before us, and demonstrate such a Construction to be agreeable to the Sacred Stile in other places.

(4.) Assign some Reasons, why, in a History of the Origin of our Earth, these remote and distant Bodies come to be taken notice of, tho' their own proper Formation did not at all belong to it.

(1.) I shall shew the truth of the Observation, in several instances from the Holy Scriptures; namely, that the Heavenly Bodies are no otherwise there described than with relation to our Earth, and as Members and Appurtenances of our Atmosphere. And this Observation is confirm'd by the first mention that is made of them in this very History we are upon; all the Circumstances whereof fully attest the truth of what is here affirm'd of them. When the Light first display'd it self, notwithstanding those numberless advantages accruing to the whole World therefrom, none are taken notice of but such as respect our Sublunary World. 'Twas intirely with regard to our *Light and Darkness*, our *Day and Night*, that all was done, as far as can be collected from the words of *Moses*. Thus, as soon as the Heavenly Bodies are made, tho' they be universally useful, they are plac'd in the *Firmament of Heaven*, (a Phrase us'd in this History for our Air only) to divide our day from night, to be to us for signs and seasons, for days and years; to be for lights in the firmament of heaven to give light upon the earth; to rule over our day and night, to divide our light from darkness. And as to the order of their Introduction, 'tis not that of their proper Greatness or Dignity, but that of their respective Appearance and Uses here below. All which is far from a full account of the real Original, universal Intentions, and true Places of these Glorious Bodies; but on the Supposition here made use of, exactly easy and natural. Agreeably whereto when our Air is clogg'd with gross Vapours, so as to hide or disfigure their Faces to us,

Gen. i. 3.
4, 5.

Verse 14,
15, 16, 17.

Acts ii. 20.

The Sun is said to be turn'd into darkness, the Moon into blood; and when some Aerial Meteors, call'd by their Names, and for a moment resembling them,

them; shoot and drop down in the Air; *the Stars* are said to *fall from Heaven*. The Sun and Moon, as if they were two Globes of Fire and Light pendulous in our Air, and hanging over certain places, are order'd to *stand still*, the one upon *Gibeon*, the other in the *Valley of Aijalon*. The Sun is represented as *set in a Tabernacle*, *rejoicing as a Gyant to run his race*. His *going forth*, is said to be *from the end of Heaven*, or the *Horizon*, and his *circuit unto the ends of it*. All which Expressions, with many others through the whole Bible, plainly shew, That the Scripture did not intend to teach men Philosophy, or accommodate it self to the true and *Pythagorick* System of the World. The Holy Writers did not consider the Heavenly Bodies absolutely, as they are Great and Noble in themselves, main and glorious Parts of the Universe; very distinct from our Earth, plac'd at various and immense Distances from it, and from one another; design'd for, and subservient to many, wise, and comprehensive Ends and Methods of the Divine Providence; dispos'd in a regular order, in proportionate and harmonious Periods and Revolutions, and finally endued with mighty Powers and Influences with respect to numerous and vast Systems of Beings. Under such a consideration we might have expected another sort of Representation of the Heavenly Bodies, their Original, Designs, Courses, and Circumstances, than the foregoing Texts, or their parallels every where afford us.¹² But if we look on them under the Notion of Neighbour-Luminaries, which are situate at the utmost bounds of our Atmosphere, and belong, as well as the Clouds, to our Earth; which are appointed to be our peculiar Attendants, and a part of our Retinue; serve our single Necessities, and

Mat. xxiv.
29.

Joshua x.
12.
Psalm xix.
4, 5, 6.

Vide Psal.
civ. 1, &c.
Isaiah xl.
22.

every day rise and set on purpose to provide for our Advantage and Convenience: If I say, we thus look upon them, (as all Men not otherwise taught by Philosophy do and must) the Texts above-cited, and the whole current of the Holy Books will easily accord and correspond to such a System. And I dare appeal to any impartial and competent Judge, to which of the foremention'd Schemes the most obvious and easy Sense of the Expressions of Scripture hereto relating are adapted; and whether it does not usually speak as an honest and inquisitive Countryman, who no more doubted of the Heavenly Bodies, than of the Clouds appertaining to the Earth; rather than as a new Astronomer, who knew them to be vastly distant from, and to have nothing in a peculiar manner to do with the same. Which will be less wondred at when we consider in the next place,

(2.) The Reason and Occasion of such ways of speaking. And here I shall not content myself in general to observe, that the design of Divine Revelation was of quite another nature, than requir'd a nice Adjustment and Philosophick Explication of the Natural World; that the Capacities of the People could not bear any such things; that the Prophets and Holy Penmen themselves, unless over-rul'd by that Spirit which spake by them, being seldom or never Philosophers, were not capable of representing these things otherwise than they, with the Vulgar, understood them: That even, still, those who believe the true System of the World, are forc'd among the Vulgar, and in common Conversation to speak as they do, and accommodate their Expressions to the Notions and Apprehensions of the generality of Mankind. I shall not, I say,
content

content my self with such Observations, most of which are usually, and with good reason, insisted on in the present case; but rather attempt to find out the true Origin and Source of such Notions and Expressions, made use of, as by most other Writers, so especially by the Sacred Ones in the Holy Bible.

God has so fram'd the Eyes of Men, that when the distance of Bodies, and their proper Magnitude is very great, they shall both be imperceptible to us. There is every way from our Eye a spherical Distance or Superficies which terminates our distinct Perception of Objects, and beyond which, all Distances and Magnitudes, absolutely considered, are not by us distinguishable. The Clouds, tho', lying parallel to the Horizon, they are (so far as comes at once within our view) almost in the same Plain, yet to us they seem bent into a concave Figure, or kind of Hemispherical Superficies, equidistant almost on every side from its Center, the Eye of the Spectator, and so seem every way to touch the Ground at a Mile or two's distance from him. And this happens by reason of the Imperfection of our Sight, which distinguishing remote Objects but to a certain distance, beyond which the Clouds are, can have no other Idea of their Situation than small and like Objects at that Spherical Superficies would excite. On which Principle 'tis certain, that till Geometrick and Philosophick Principles rectify mens Notions, all Bodies whatsoever beyond the Clouds, such as the Cœlestial are, must needs be esteem'd at the same equidistant Superficies with the Clouds, and appear among them; and by consequence 'twould be on this account, as possible for the Vulgar to be persuaded that the Clouds were vastly remote from,

and bear no relation to this Earth, as that the Sun, Moon, and Stars were so; and to them as strange to have found no account of the Formation of them with that of the other visible World, as the omission of the *Clouds* would have been. It being impossible that the Sun, for instance, tho' so many thousands of Miles distant, should to us appear above one or two from us; and alike impossible that his bigness, tho' so many thousand Miles in Diameter, should appear to be as many Feet to us on Earth: As all who have any skill in Opticks very well know.

So that when these Heavenly Bodies are and must needs be to our Sight and Imagination at the same distance with the Clouds, and consequently, *as to us*, are with them plac'd in our own Air; when their visible Magnitude, Situation, Motion, and Habitudes, are all one *with respect to us*, as if they really were light and fiery Balls rowling upon or among the Clouds; when their apparent Changes, Figures, Colour, Countenance, Effects, and Influences would be (as far as Sense and vulgar Observation could determine) *on this Earth*, and *to its Inhabitants*, the very same as were to be expected from such light and fiery Balls, revolving at the presumed distance; when all wise Men, especially the Sacred Penmen, in their Writings design'd for the Advantage and Instruction of all, condescend still to the Apprehensions and Capacities of Men, and speak of the *Being* of things as they constantly *Appear*; of which the Bible is full of instances: All these things consider'd, 'tis not to be wonder'd at, that the Heavenly Bodies are accounted Appendages of our Earth, and agreeably thereto made mention of in the *Mosaick Creation*.

(3.) I shall explain what, according to my Notion, must be meant by the Creation or Production of these Heavenly Bodies in the History before us; and demonstrate such a Construction to be agreeable to the Sacred Stile in other places. Now 'tis easy to tell what is meant by their Creation in the case before us, when it has appear'd that their Production out of nothing was precedaneous to the six days Work, and that they are wholly consider'd as belonging to our Earth, and plac'd in our Air; *viz. their primary being so plac'd; their first becoming visible to Men on Earth, or in other words, their original appearing to be there.* I mean in plain English, Light is said then first to *Be*, (for it being an effect of the Heavenly Bodies, not a distinct thing from them, is not by *Moses* said to be *made* or *created*) Gen. i. 3. when the superior Regions of the Chaos were become so far clear and defecate, that the Rays of the Sun in some degree could penetrate the same, enough to render a sensible Distinction between Night and Day, or that space the Sun was above, and that it was beneath the Horizon. And agreeably, The Sun, Moon, and Stars, are then said first to *Be*; or to *be made*, when afterwards the Air was rendred so very clear and transparent, that those Luminaries became conspicuous, and their Bodies distinctly visible, as in a clear Day or Night they now appear to us. Ver: 14, 16.

That this Exposition is agreeable to the Scripture Stile, is evident by this Observation; That several things are there affirm'd to *Be*, in any certain manner, when only those effects we feel are such as they would be were they so indeed; and 'tis not unusual to assert the *Being* of any Cause, when all those consequences are no other-

wife in the World, and with regard to Men, than they must and would be upon its real Existence, without any exacter niceness as to the truth of the same. Thus God is said several times to *repent* of somewhat he has before done, when his future Actions are the very same as would in Humane, as well as Divine Affairs, be the certain consequents of a proper Repentance: Thus also God is said to be *pleas'd* or *angry* with Men, and that in a very *passionate* and *sensible* manner, when he confers such great Mercies, or inflicts such great Judgments, as, were he really so, he must naturally do. Thus also *Eyes* and *Ears* are frequently suppos'd of God, because he as certainly is conscious of all the Actions and Speeches of Men, as if he really saw and heard the same. In a different instance, The Sun is said to *stand still* or *move*, tho' in propriety of Speech, as is now well known, those affections ought to be ascrib'd to the Earth, because every thing, as to sensible appearance, is in the same condition as from the Annual and Diurnal Motions of the Sun, were they real, must, and would obtain. The Sun is said to be *turned into Darknes*, and the *Moon into Blood*, when without any alteration in themselves, they appear of a dark or bloody Countenance to the Inhabitants of the Earth. Nay, which is most of all to our present purpose, God is then said to *make all things new*, and to *create a new Heaven, and a new Earth*, when he so changes the Constitution and State of our Earth, as to render thereby this whole Sublunary World very different from, and much excelling that which formerly appear'd. In all which, and innumerable other instances, 'tis plain and evident, that the Holy Writers do not consider merely how things *are* in themselves, but how

Apoc. xxi.

5.

Isaiah lxxv.

17.

how they are to us ; not what is their proper nature, but visible appearance in the World.

But here, lest this Doctrine should be abus'd, I must interpose this necessary caution, That such a liberty is neither by other Authors, nor the Sacred Penmen taken on all occasions, or in every case; but peculiarly when the sublimity of the Matter, the capacities of the People, the more easie instilling useful principles into Men, or some other weighty reason, requires such an accommodation. 'Tis chiefly with regard to the Spiritual Nature, and sublime way of operation in God; or such Physical and Philosophick Truths, as relate to distant, invisible, or inaccessible bodies; the absolute Essence or Affections whereof, were not explicable to the vulgar in a plain and natural manner. In which cases this Liberty in the Interpretation of Scripture is, with the greatest Justice to be allow'd. But 'twere thence very unreasonable to extend it to all others, or indeed to any, where the same, or as good, reasons were not assignable. He who should argue, that because the Literal sense of Scripture about the Corporeal Members, and Humane Passions of the Divine Nature, is not to be strictly urg'd, that therefore when he is call'd a Spirit, and represented as the Rewarder of Good, and the Punisher of Bad men, those Expressions are no more to be depended on; or he who should infer, that because the First and Fourth Days Works, the Origin of Light, and the making of the Heavenly Bodies, must not be strictly literal, that therefore neither in the *Mosaick* Creation, ought the other four to be any more esteemed so; He, I say, that should thus argue or infer, would be very unfair and unreasonable; because he would as-

fert

fert that in one case, without ground, which on peculiar and weighty ones alone was allow'd in another. Thus those things that are ascrib'd to God, which evidently agree to his Nature, and Idea, are surely to be literally understood; tho' the other which are repugnant thereto be not: And in like manner, 'tis but just to believe, that so much of the *Mosaick* Creation, as related directly to the Earth and its appurtenances, and so came at once within the comprehension of the History, and of the capacities of the Readers, ought literally to be Interpreted; tho' some things extraneous to the Formation of the Earth, and beyond the notice of the People, be to be taken in a different acceptation. Tho' the common use of Tropes and Figures make our Speech very often not to be *literal*, yet generally we can understand one another very well without danger of deception, or of turning plain Sentences into Allegorical Discourses, in our Conversation one with another.

And 'tis evident that the Holy Books ought not to be tormented or eluded, as to their obvious sense, on every occasion, under pretence that some particular Texts are to be construed another way. That SACRED RULE ought for ever RELIGIOUSLY to be observed, *That we never forsake the plain, obvious, easie and natural sense, unless where the nature of the thing it self, parallel places, or evident reason, afford a solid and sufficient ground for so doing.*

Now this being presuppos'd; I shall leave it to the impartial Reader to judge, after the perusal of this whole discourse, whether I have not substantial reasons for the present Exposition; and whether therefore, any one ought to blame
my

my receding from the Letter in this single case, or imagine that I give a just handle thereby to others, to Allegorize this History of the Creation, or any other parts of Scripture.

And I must here own and profess, That tho' I think, in case the common Translation be receiv'd, there is an absolute necessity of receding from the Letter in the point before us, and that this Venerable and Sacred *Kosmologia*, or history of the Creation, is otherwise in the highest degree, strange and unaccountable to the free Reason of Mankind; yet I am fully of opinion, that generally the difficulties occurring in the Sacred Books are to be clear'd, not by a greater receding from, but a closer adhering to the obvious and most natural Interpretation of the Periods therein contain'd: And that the general nature of the Scripture Stile every where duely observ'd and consider'd, several great scruples with relation to the Actions and Providence of God, and other things contain'd in those Books, would be taken away, if we might be allow'd to recede a little from the receiv'd opinions of men, and Placits of Systematical Authors; on no other condition than that, for a recompence, we keep so much the closer to the Oracles of God, and the obvious and literal Interpretation of them; and explain the Bible no otherwise than the plain words themselves would appear most naturally to intend to any disinterested and unconcern'd Person: Of which many instances might easily be given, were this a proper place for it. But I must leave this digression, and return to what I before propos'd in the

(4.) Last place, *viz.* To Assign some Reasons why in a History of the Origin of our Earth, these

these remote and distant Bodies come to be taken notice of, tho' their own proper formation did not at all belong to it. Now tho' many might easily be alledg'd for this procedure, yet I shall include the main I intend here to insist on in the two following:

(1.) The Advantage of the *Jews*, or securing them from the Adoration of the Host of Heaven, could not otherwise have been provided for. Now as the foundation of such Idolatry is taken away by their being included in this History, which imply'd them to be such dependent and created Beings, as could have no influence of their own, but what were deriv'd from God; and consequently were subject to his disposal and government; which affirm'd them to be by Him plac'd in the Firmament, and there subjected to such Motions, Rules and Laws, by which they became advantageous and serviceable to the World: So had they been taken no notice of, they would have seem'd exempted Bodies, and when all Worship of Terrestrial things was demonstrated, by this account of their Original, to be foolish and absurd; that of the Celestial Bodies would seem thereby to be permitted at least, if not patroniz'd and recommended to 'em.

For when, as we have before observ'd, 'twas impossible for the *Jews* to know the real state of the case, and to apprehend that they were vastly remote from, and so no way belonging to this Earth, or its Formation; there was no other way to apply a fitting remedy, to that prevailing custom of Worshipping the Host of Heaven, (so particularly caution'd by *Moses*) but to condescend to the Capacities of the People, and supposing them Light and Fiery Globes pendulous in

in the Air, and revolving just beyond or among the Clouds, to recount their *respective*, as well as the *real* Formation of the other parts of the visible World, and assign them their proper place, and distinct period in the Six days work, as well as any other more directly concern'd therein. The Sun, Moon, and Stars were such noble and glorious Bodies, and so visible, so remarkable, so useful parts of the World; and the Heathen Nations so generally doted on the Worship of them; that had they been intirely omitted in this particular account of the Origin of things, there would have been the most eminent danger of this kind of Idolatry among the *Jews*; and the seeming approbation of that practice, to which they were so prone before, from the silence of their great Lawgiver in his Creation of the World, might probably have defy'd all dissuasions, and been the most fatal encouragement to them, to so vile a Worship that were easie to be imagin'd. Any particular declaration of the reasons of such omission, from the real Distance, Magnitude, Motions, and Designs of the said Bodies, and how improperly they could be reduc'd within the said narration, (the only precaution supposable in the case) being more likely to discredit the whole Book, than overcome their prejudices, than give them a true and just Idea of the matter it self, and so obviate their false reasonings and practices thereupon in the foremention'd Idolatry. So that 'twas absolutely necessary to include the Heavenly Bodies in the *Mosaick* Creation, in order to prevent Idolatry among the *Jews*: which seems to have been a principal aim not only of recording this whole Narration, but of the intire *Mosaick* Dispensation.

tion : and therefore was in the first place by all means to be consider'd.

(2.) The peculiar Nature and Circumstances of this History of the Creation, necessarily require the mention of the Heavenly Bodies, as well as of any other parts of the Visible World. And 'tis this mistake that has hitherto hindered any rational account thereof ; that men have either suppos'd it a Real and Philosophical relation of the proper Creation of all things ; or a meer Mythological and Mysterious Reduction of the visible parts of it to six periods or divisions, under which mighty Mysteries were suppos'd to be hid, and by which the foundation of a seventh-day Sabbath was to be laid among the *Jews*. Now tho' somewhat of truth I believe be contained in each of these different notions ; yet I think 'tis undeniable that they are neither of them to be acquiesced in, and by no means give a satisfactory account of the compleat Nature and Kind of this History. That alone to which all its particulars exactly answer, and which is as Literal and Philosophical as the capacities of the *Jews* could expect or reach, and did require, is, *An Historical Journal or Diary of the Mutations of the Chaos, and of the visible Works of each Day, such an one as an honest and observing Spectator on the Earth would have made, and recorded, say and believ'd to be, in all cases the truth and reality of the things themselves.* Now that this Idea alone fits this Sacred History, might easily be made out by the consideration of the particulars related, and of those omitted, with all the other circumstances thereof, by no means corresponding to any other Hypothesis ; but most exactly to this before us ; without the least force offer'd to the Nature and System of the World, to the Divine Perfections,

Perfections, or the Free Reason of Mankind; and exactly suitable to the Style of the Holy Books, in the mention of the *Phaenomena* of the Natural World in other places. Which being suppos'd (and by that time this Dissertation is consider'd throughout, I hope 'twill appear no precarious supposition,) 'tis evident that both the appearance of Light, and of the Bodies themselves, the Sun, Moon and Stars, (the things we are now enquiring about,) must as certainly come within such a Journal, and make as remarkable Turns and Changes in the World, as far as this Spectator could judge, as any other within the intire six days could possibly do. The appearance of Light to him who never before is suppos'd to have seen such a thing, and was till then incompass'd with the thickest Darkness; and the plain view of the Heavenly Bodies themselves to him who before had no manner of notion of 'em, especially when he had no possible means of distinguishing them from Light and Fiery Balls, situate with, and pertaining to the Clouds; must as certainly have inferr'd a new Creation, and under such a notion have been recorded in their due place in the Journal before-mention'd, as any other whatsoever; and their order, position, and uses would naturally be recounted no otherwise than we now find them in the *Mosaick* Creation. From which consideration I think 'tis not at all surprizing, that these parts of the Visible World, how remote and sepearate soever they be from our Earth in themselves, are yet included in this History before us; and have their distinct periods in the six days work; tho' at the same time the *Kosmos* it self do properly relate to the formation of the Sublunary World only.

IV. I prove that the History before us, extends not beyond the Earth and its Appendages, because that confused Mass, or rude heap of Heterogeneous matter, which we call the Chaos, whence all the several parts were deriv'd, extended no farther. It will here I suppose be allow'd me, that the ancient Chaos, so famous among the old Philosophers, and so evidently refer'd to by *Moses*, was the intire and single source or promptuary of the six days productions; and that consequently nothing ought to be esteem'd a part of that *Creation*, but what in its Rudiments and Principles was so of the Chaos also; and this *Postulatum* is so agreeable to *Moses*, as well as all the antient accounts of the *Chaos*, and I think so suitable to the sentiments of most men, that I shall, without farther proof, suppose it granted, and betake my self immediately to the other branch of the argument, and endeavour to evince, that the Chaos was so far from comprehending the intire matter of the Universe, nay or of the Solar System, that it reach'd not so far as the Moon, nor indeed any farther than that Terraqueous Globe we now Inhabit, with such Bodies as are immediately contiguous and appertaining thereto. Which I think the following arguments will sufficiently demonstrate.

(1.) If we Appeal to External Nature, and enquire what confused Masses or Chaos's either at present are, or ever, within the Annals of Time, were extant in the Visible World, we shall discover no footsteps of any such thing, excepting what the Atmosphere of a Comet affords us. If therefore, without the allowance of precarious and fanciful Hypotheses, relying on no known *Phænomena* of Nature; a Comet's Atmosphere be

be the sole pretender, if moreover the same Atmosphere gives a Just, Adequate, Primitive, and Scriptural Idea of that ancient Chaos; if it answers its particular *Phænomena*, recounted by Sacred or Prophane History; if it prove a peculiarly fit Foundation of such an Earth as ours is, and is extraordinarily adapted to suit, and account for its present and past *Phænomena*; all which shall be prov'd hereafter; I think we may cease our farther enquiries, and with the highest reason and justice conclude, That a Comet, or more peculiarly the Atmosphere thereof, was that very Chaos, from whence that World arose, whose Original is related in the *Mosaick History*: And with equal reason and justice be satisf'd, (which is but a certain consequent thereof) that not the innumerable Systems of the fixt Stars, nor the narrower System of the Sun, nay nor the Moon her self, but our Earth alone, was the proper subject of the *Mosaick Creation*. Which conclusion will be farther establish'd by the coincidence of the several days works recounted by *Moses*, with those Natural and Orderly Mutations which, in the Digestion and Formation of a Planet from a Comet's Atmosphere, would Mechanically proceed, as hereafter will appear.

Vid.
Hypoth. 1.

(2.) The Chaos mention'd by *Moses* is by him expressly call'd *The Earth*, in contradistinction to *The Heavens*, or the other Systems of the Universe; and all its parts taken notice of in the Sacred History, appear, by the following Series of the Scriptures, to belong to our Earth and no other. The words of *Moses* are, *In the Beginning God created the heaven and the earth; and the earth was without form and void, and darkness was upon the face of the deep; and the*

Gen. i. 1,

2.

D

Spirit

Spirit of God moved upon the face of the waters. Where I think 'tis plain, as has been already observ'd, that when the Author comes to the Chaos or Foundation of the six days work, he excludes the Heavens from any share therein, and calls the Chaos it self *An Earth, without form and void*, with Darkness upon the Face of its Abyſs; and this all ought to grant, these being the very Words from which 'tis concluded that the Hea-then Chaos was no other than what *Moses* deriv'd the World from.

And that the Chaos is here confin'd to the *Earth*, will be sure put past doubt by the latter part of this Argument, which observes no other parts to be mention'd belonging thereto, than such as the succeeding Series of the Holy Scriptures shews to have afterward belong'd to our Earth and no other, *viz. An Abyſs or Deep, and Waters*: Both of them frequently mention'd in the Holy Books, and now actual parts of the present Globe, as will appear hereafter.

So that when *Moses* calls his Chaos expressly the Earth; when by the coherence of his discourse he excludes the Heavens, taken in a large and proper sense, from the same; when, lastly, he mentions no other parts of this Chaos than such as afterward, and at this day, are parts of our Earth; 'Tis somewhat unaccountable, and like a kind of fate upon Commentators, that they should unanimously resolve to make this Chaos of so extravagant a compass as they too incongruously do; and that they should agree in it so universally, tho' without any warrant from, nay contrary to, the obvious sense of the Text it self, and the plain drift, coherence and description of *Moses* therein. I know it will be said the First and Fourth days works, (the Origin

gin of Light, and of the Sun, Moon and Stars) necessitated such a supposition, and gave just cause for the common Exposition. Which as I believe to have been the true occasions of all such mistaken Glosses, so I think them far from just and necessary ones; and if what has been already said has clear'd those difficulties, there can be no reason to reject the Cogency of the present Argument, but a great deal to rest satisfi'd in it; and to confess it no less unscriptural than 'tis absurd, to expect from this single Chaos, a Sun, Moon, and Systems of fix'd Stars, as hitherto the World has commonly done.

(3.) The *Mosaick* and ancient *Chaos* could not include the Sun or fix'd Stars, because just before the extraction of Light from it, as 'tis usually explain'd, it was Dark and Caliginous; which on such a supposition is not conceivable. A strange Darknes this! where more than ninety nine parts of an hundred (whether we take in the intire System of the World, or the Solar System only) appear to be fiery Corpuscles, and the very same from whence all the fix'd Stars, or at least the Sun, were constituted; and are now the Fountain of all that Light and Heat which the World has ever since enjoy'd. Let every unbiass'd person judge, how Dark that *Chaos* could be, where the Opaque and Obscure parts were so perfectly inconsiderable in comparison of the Light, the Active, and the Fiery ones. So that on this Hypothesis, The state of the Chaos must have been exceeding Light, Hot, and Fiery, before the first days work; when it was on the contrary, according to all Antiquity, Sacred and Profane, Dark and Caliginous. 'Tis true, upon the separation of the particles of Light (the business, in this Hypothesis; of the First Day)

*Vid. Lem.
33. infra.*

the Chaos would become Obscure and Dark enough, at the same time that the Sun, or fix'd Stars, were collecting their Masses so lately extracted, and were growing Splendid and Glorious. But this is to contradict the History, according to which the Light, on the First Day, is consider'd with relation to the Chaos, and its distinguishing Night and Day *There*, not as it was collecting into Bodies of Light without it (which rather must belong to the Fourth Days Work); when by this account 'tis evident, that this day is the peculiar time for the most pitchy Darkness possible. For when all the Light was just separated from the Chaos, the most Caliginous Night must certainly ensue. So that unless we can change the Order in *Moses*, and prove that the Chaos before the First Days Work was all over Light, and on the First Day cover'd with the Thickest Darkness, we in vain pretend to justify the vulgar opinion, and include the Sun or fix'd Stars among the other Matter of the Chaos.

Besides, when Heat is the main Instrument of Nature in all its separations of Parts, and Productions of Bodies, 'tis sure a very improper season just then to extract the Light and Fiery Corpuscles out of the Chaos, when the Formation of things began, and there was the principal occasion for their presence and efficacy, that ever was or could possibly be. A strange method of Generation! To take away the Cause at the very instant when it was to produce its Effects, and to recount the Effects not before, but as soon as ever the Cause is taken away! But to proceed.

(4.) The now undoubted property of the Universal Gravitation of Matter, contradicts and overthrows this fancy of the Heavenly Bodies having been

been originally included in, and at the Creation extracted from the Chaos of which we are speaking. For on this Hypothesis when once they were mingled with the parts of the Earth, and are since at immense distances from it, they must have fled off every way from their former place, and in a small space of time have thrown themselves to those vastly remote seats which they have ever since possess'd. Now if instead of the *vis centripeta*, a *vis centrifuga*; instead of mutual attraction, a mutual repulse or avoidance were found to be the standing unchang'd Law of Nature, and Property of Matter, this might have look'd like a possible, at least, if not a probable Hypothesis; and the whole Order of Nature ever since need not have been contradicted in this primary formation of things. But when the contrary force, that I mean of mutual tendency, attraction, or gravitation obtains, and that, as far as we have any means of knowing, universally, which Mr. *Newton* has demonstrated, there is no room or foundation in Nature for such an Imagination.

'Tis by no means impossible that all the Bodies in the Universe should approach to one another, and at last unite in the common Center of Gravity of the intire System: Nay from the universality of the Law of Gravitation, and the finiteness of the World, in length of time, without a miraculous power interpose and prevent it, it must really happen. But by what Law of Nature, or Property of Bodies, they, when once conjoin'd, (as those I now oppose must affirm) should be separated, 'tis hard to conceive.

Which difficulty is increas'd by the prodigious velocity of their motions; when, according to

*Vid. Coroll.
1. & 2
Lem. 11.
infra.*

the vulgar Hypothesis, but a few hours can be allow'd the Heavenly Bodies to waft them to those immensely, yet variously distant Seats, which they were immediately and for ever after to possess. All which harsh and ungrounded fictions are intirely avoided, and all things represented according to the known Laws of Matter and Motion, in that natural and easie Hypothesis we take, and which therefore is as consonant to, as the other is averse from, the Make and Constitution of the Natural World.

(5.) This fancy, that the Heavenly Bodies proceeded originally from the Terrestrial Chaos, and cast themselves off from it every way, supposes the Earth to be the Center of the World, or of all that System of Bodies, and they plac'd in a kind of circumference every way about it. How well soever such a Notion would agree with the Vulgar or *Ptolomaick* System of the World, I fear the *Pythagorean*, which has forc'd its reception, and is universally receiv'd by Astronomers, will not at all square therewith. In that account which would only include the Planetary or Solar System within the six days Creation, the Sun, its known and undoubted Center, seems the only proper place for such a Chaos as were to be the common source and promptuary of the whole: But in the vulgar account, where all the Stars and Planets of the Universe are to be suppos'd at a Center together, we, who know not the bounds and circumference of the World, cannot be suppos'd able to pitch upon a Center proper for so immense and strange a Chaos. Only one may venture to say, that the Earth, a small moveable Planet, revolving about the Sun, is an ill-chosen one however.

And

And now upon a recollection and view of this whole Argument, I do not question but an unprejudic'd person, who knew nothing of the sentiments of Commentators, or of the opinions of the vulgar, and who had only been conversant in the Works, and Word of God, the Book of External Nature, and the Book of Scripture, would easily find the bounds of the *Mosaick Creation*; and on a little consideration and comparison of the Sacred and Profane Accounts of the Primitive Chaos, with the present Nature and Situation of the Heavenly Bodies, would quickly be convinc'd that our Earth alone were therein concern'd; he could scarce be suppos'd once to Dream that the Origin of the Sun and Planets, much less of innumerable Suns and Planets, and of the intire Universe, was there accounted for. Such Notions, how generalsoever, are not the result of Nature and Scripture carefully consider'd and compar'd one with another, but the effects of ignorance of the frame of the World, and of the stile of Scripture; of an unacquaintedness with the Works, and thence an inability of judging concerning the Word of God relating to them; or indeed commonly of a certain *luxuria*, or narrowness of Soul, which Temper, Education, Conversation, Application to some particular Studies and Authors, with a strangeness to free and generous Enquiries, some or all have been the unhappy occasions of. In short, 'tis because men are not able to give themselves or others a satisfactory account of such things, that they are forced to fall into a beaten path, and content themselves with those poor and jejune Schemes, which, when carefully examin'd, prove neither Rational nor Scriptural, but as perfectly contradictory to

found Philosophy, as the genuine sense of those very Texts on which they build their conclusions. Every unbiass'd Mind would easily allow, that like Effects had like Causes; and that Bodies of the same general Nature, Uses, and Motions, were to be deriv'd from the same Originals; and consequently, that the Sun and the fixed Stars had one, as the Earth, and the other Planets another sort of Formation. If therefore any free Considerer found that one of the latter sort, that Planet which we Inhabit, was deriv'd from a Chaos; by a parity of Reason he would suppose, every one of the other to be so deriv'd also; I mean each from its peculiar Chaos.

Nay truly I might carry this matter still higher, and if one Planet must be made Parent to another, justly claim the principal place for *Jupiter*, about sixty times as big as our Earth, and the largest and most considerable of all the Sun's *Chorons*; and so with greater shew of Probability assert, that from its Chaos any of the other Planets were deriv'd, than himself from theirs. Particularly the Earth is so small a Globe, that in point of Dignity or Origination, very many of the Celestial Bodies may most fairly claim the precedence of her, and curb her aspiring pretensions to any such mighty Prerogatives above her Fellows. There is in reality no occasion for any such childish reasoning on either side; and every one of the Planets (especially the Moon, so exactly resembling her Sister Earth) ought to be deduc'd from a distinct Chaos of its own, as well as that particular one which Providence has allotted for the Seat of Mankind. And 'tis not to be question'd, were we as well acquainted with the Nature, Constitution, and Uses of the other Planets, with their various Inhabitants, and the
several

several methods of Divine Providence relating to 'em all; we should not be backward to allow 'em every one a proportionable share in the care of Heaven, and a like conduct in their Origins and Periods, as the Earth, on which we dwell, can boast of. We should, 'tis probable, soon understand, that, (bating the stupendious and miraculous dispensation of the Gospel by the *Messias* *Christus*) as well the Moral, as the Natural Histories of these Worlds; those of their first rise out of Chaos, of their several Changes, Revolutions, and Catastrophes, with regard to the inanimate, the animate, and Reasonable Beings, both as to the dignity of the things themselves, and their newness to us, would equally deserve the view and consideration of Inquisitive Minds, with any like Accounts relating to our own Earth; and we should easily satisfy our selves, that the single Chaos, the Seminary of our present Earth, was so far from extending it self to the Sun, or fixt Stars, that not the least secondary Planet in the Solar System could be contain'd therein.

V. The *Mosaick* Creation is confin'd to our Earth, with its Appurtenances, because otherwise the time of the Creation of each Body was so extreamly disproportionate to the Work it self, as is perfectly irreconcilable to the Divine Wisdom of its Creator, and the accounts of the Works themselves as they are set down by *Moses*.

In order to the *Reader's* perceiving and admitting the force of this, and some following Arguments, I must premise some things touching the nature of such Reasonings, and how far they may be made use of without any just Imputation

tion of Boldness, Irreverence, or an audacious Stinting and Determining the Divine Actions.

And here I freely confess, That 'tis not necessary in all Cases that we should comprehend the reasons of the Divine Actions or Providence before we can be under an Obligation to believe them. They may be hid from us on several accounts, tho' the things themselves be plain in Scripture. Under which circumstances, I heartily own the strictest Obligation to yield our unfeigned Assent to what God has clearly reveal'd, notwithstanding we cannot see the intire accountableness thereof to our imperfect Understandings. But then, 'tis one thing to be *above*, and another to be *repugnant* to our Reason; 'tis one thing to be beyond the comprehension of, and another directly contradictory to our Humane Faculties. Besides, the clearness or obscurity of the Revelation is here very considerable; the former case resolves our Assent into the Divine Veracity; but the latter may only be the mistakes of Humane Deductions, and by consequence, tho' our fallible reasonings be superseded by the first, yet there is room for them in the second. I believe, for instance, and am oblig'd so to do, that our Saviour Christ is truly *Θεὸς ὁ υἱοῦ τοῦ Θεοῦ*, God and Man, because I find it every where plain and evident that the Stile, Titles, Attributes, Actions, and incommunicable Name of the Eternal Deity, the God of *Israel*, are at least as frequently ascrib'd to him the Son, as to the Father himself, through the whole Bible; notwithstanding any inability of comprehending the Nature of God, and thence of judging of the Unity or Plurality of Persons in the Divine Essence. But I do not think my self equally oblig'd to believe the

the Doctrine of absolute and uncondition'd Reprobation, because the Proofs alledg'd for it are far from being clear, and because 'tis not so properly above, as contradictory to the most evident Reason. And this comes nearest to the present case; in which, neither can any one justly assert the plainness of the Revelation on the side of the common Scheme; nor alledge the sublimity of the Subject, on account whereof it might be fairly suppos'd above the reach of our finite Capacities. The Scripture, as I take it, is evidently for, at least must be own'd not evidently against this restrained Sense of the *Mosaick* History before us; and the Subject it self is finite and limited, and so within our ken, and capable of our comprehension: On which accounts such Arguments as follow, ought to have their place, and if considerable, their force and influence on our Faith also, and go a great way to determine such a Dispute as we are now upon.

And 'tis sure not impossible, within certain bounds, for a considering man to determine what is rational, wise and prudent; what is consonant to the nature of things; what is suitable to forecast and contrivance; what is in most cases proper, decent and becoming, even with relation to the Divine Operations in the World. We naturally, in the reflecting on the System of External Nature, observe many Marks and Tokens of the Wisdom and Art, the Skill and Artifice of the Great Creator; which supposes that we are competent Judges in such matters. And indeed, 'tis but changing the Scene, and considering what we naturally pronounce to be rational and orderly, fit and proportionable among Men; what will become a Wise General or
Statef-

Statesman, a Skilful Builder and Architect, nay an ordinary Workman or Artificer, in usual and obvious cases: What on the one hand are the Tokens of Foresight and Prudence; and on the other, of Heedlesness and Folly, in the common Affairs of Life; and we shall not wholly be to seek what to think of several analogous Actions relating to God himself: Due allowance being every where made for that infinite distance, and different state and management of the Supreme Governour of the World, from those of all finite Beings, depending on, and subject to him. Thus we collect our Idea's of the Divine Attributes, by considering what is good, great, valued, and esteemed lovely and venerable among Men, and ascribing every such thing to the Divine Nature; who being the Origin of them all, must contain 'em within himself in a higher and more eminent manner. By accumulating all things that appear Perfections in Men, or other Creatures, and removing all Imperfections necessarily adhering to them, we arrive at the Notion of an Infinitely Perfect Being; which is but another name for God; and whom, on that account, we justly think the proper Object of our Worship and Adoration.

When therefore our very Idea's of the Divine Properties are owing to, and depend on, our consideration of those lesser degrees of the same which we observe in Men; and when the reason why the contrary Properties are not by us ascribed to him, is, because we find that in Men they argue imperfection; what is a sign or effect of some degree of Perfection in Men, must also be acknowledg'd a sign or effect of a like Perfection in God. And what is a sign or effect of Imperfection in Men, must also be own'd, if it were
sup-

supposable, a sign or effect of a like Imperfection in God. Thus for instance we certainly gather, that God cannot be properly pleas'd or delighted in the misery and torment of his Creatures, where yet the Justice and Wisdom of his Government require him severely to punish 'em; Because we cannot but esteem it an odious Vice, and base Imperfection in a Judge on Earth, in like cases, to be so affected; and whether we will or no, we look upon it as an instance of cruelty and barbarity of disposition to relish and taste a sweetness, in the Cries and Groans of condemned and dying Malefactors. In like manner we justly conclude, God cannot *impose* on Innocent Creatures, no not by such Wiles, Stratagems, or other methods of Collusion, wherein yet direct and downright Falsehood were avoided; because we find a spontaneous aversion and indignation arises in our minds when such Tricks and Shams are discovered among Men. And by the same way, and equal force of reasoning may we collect, that God cannot, in the formation or disposition of things, no more than in other cases, act absurdly or disagreeably to Reason; disproportionately or unsuitably to the nature of things; immethodically without rule and order, or foolishly without drift and design, according as an impartial and considering Man, who were duly acquainted with the System of Nature, would judge and determine in the case. And consequently, 'Tis a dishonourable reflection on God, to ascribe to him those things which to the free Faculties of Mankind would amongst us be look'd on as marks of unskilfulness, imprudence, or folly, in parallel cases; and for which meer Men could not escape the most severe and indecorous imputations.

Put

Put the case that I should chance to observe a certain Master-builder in his parcelling out the several distinct Tasks of the Under-workmen, and apportioning the time he would allow to the finishing of the whole; and that I perceiv'd 9 parts of 10 were to be done in one day, but the other single part had a month's space assigned to it; and yet 9 parts of 10 of the intire number of Workmen were to club together for that Work to be done in the month, while only every tenth man were permitted to assist at the days task: Were it possible to suppose such a case on Earth, I need not inform you what opinion the Spectator would have of the Abilities or Prudence of the Architect. Or, Put the case that an ordinary Husbandman, who had two Plots of Ground, the one of a score feet in circumference, not very promising or capable of Cultivation above others, the other of a thousand Acres of good Land, and very fit for Tillage or Improvement; should spend four or five days every Week about his little spot of Indifferent Ground, and allot no more than the remaining one or two for the Care and Management of the other spacious Field: 'Tis easie to imagine under what Notion and Character the Plowman would pass in the World. Or lastly, Suppose one should light upon an Historian, who undertook to give a compleat and full Account of some large and spacious Country, with the many Noble Kingdoms, Principalities, Lordships, and Governments therein contain'd; and upon perusal nothing was to be found mention'd in any particular manner, but a certain little and remote Island (so inconsiderable that the generality of the Inhabitants of the Main Land never heard so much as its name) which indeed was describ'd carefully

carefully, and its several circumstances diligently accounted for : But as to the rest, there appear'd no more than at the conclusion of a Chapter two or three names of its principal Divisions, and some advantages which one or two of their Maritime Towns afforded this small Island, and then all was concluded. Now he that should take this for a just and adequate History of the whole, and earnestly contend for the Compleatness and Perfection of the Work, would be certainly taken for a *strange* person ; or rather would be thought in Jest, and to design the real exposing of the folly and ridiculousness of the Publisher thereof. These familiar instances amongst Men shew what unbrib'd and untainted Nature instantaneously pronounces in such cases ; and thereby directs us what we ought to judge in parallel ones in which God himself is directly interested.

Where the change of the Person is so far from altering, that it exceedingly confirms these dictates of Right Reason, and makes those suppositions which were harsh and incredible with regard to Men, to become intolerable and impious when apply'd to the Deity. Whatsoever bears the characters of Truth, Justice, Order, Wisdom, and Contrivance, which I cannot but expect from good and skilful Men ; I undoubtedly require and believe of the Divine Majesty without the least hesitation, in the highest degree and supreamest measure imaginable. But whatsoever looks like Falseness, Injustice, Confusion, Folly, and a Wild Disproportion or Precipitancy among Men, and which I am difficultly induc'd to imagine of a frail and imperfect Creature like my self, I am much more hardly persuaded, or rather find it impossible to believe of God. Those very faculties by which I am enabled to distinguish and pass

pass a Sentence in these matters, are deriv'd from God, and a part of the Divine Image on the Soul of Man; and shall I so odly make use of them, that what I could not be brought to credit of any one of my Neighbours, it were so uncouth, absurd, and preposterous, I freely admit and contend for when ascrib'd to my Creator? The Mind of Man, if it have leave to reflect freely, can no more acquiesce in any Scheme of the Works of God, where nothing of Fore-cast, Order, *Decorum*, and Wisdom is conspicuous; where every period appears puzzling, immethodical, disproportionate, and ill dispos'd, (such is that of the vulgar Idea of the *Mosaick* Creation, as will be prov'd presently) than it can believe contradictions, or that God is an Infinitely Wise and Perfect Being indeed, but yet at the same time acting what, in the common sense of Mankind, argues the greatest folly and imperfection; which intirely and with plenary satisfaction to do, is certainly impossible. There is somewhat in the Humane Soul that has too quick a sense of the decency and fitness of things, and withal too deep a veneration for the Adorable Majesty of God, to be *easy* under, tho' it may be *overborn* with such Notions. It cannot be willing to believe that of its Wise and Glorious Creator, which for another to believe of it self would be esteem'd as an high indignity.

'Tis true, there is so great a difference between the compass of the Divine, and the straightness of Humane Knowledge; between the State of Creatures and of the Creator, Blessed for evermore; there may be such an incapacity in us to reach, or unfathomable, yet wise, reasons for God to hide some things from us; not to insist on the Divine Prerogative, which
 frees

frees him from the obligation of giving an account of every thing to any of those Beings he has made ; That we ought to be very wary of Arguing from Man to God, without due allowance for these considerations; and consequently mighty cautious of affirming or denying whatever is ascrib'd to him from such a comparison. In particular, wherever a clear Revelation interposes, we are bound to quit our fallible reasonings, and fully to acquiesce in such a decision : It being impossible for God to *Lye*, but by no means so, that *we* may be *mistaken*.

But then this necessary prudence and wariness is chiefly, if not only, concern'd in sublime and mysterious points; concerning the incomprehensible Nature, or unsearchable Providences of God ; which Doctrines sometimes are so much above the present Scene of things ; so remote from the notions and affairs of this World ; relate to and depend on such other Systems of Beings or circumstances of the Invisible World ; that we ought not rashly to pass our Judgment of them ; but wait till our Souls become so improv'd, and our Understandings enlightened in a future state ; till our means of information, and opportunities of looking through the whole Chain and System, be so many more than now they are, that we may justly be suppos'd more competent Judges, and equal Arbitrators, than at present the imperfection of our condition will permit us in reason to pretend to.

But this being again precaution'd, to prevent any misconstruction or abuse of this reasoning, I cannot but say, that since 'twill be hard to prove the case before us to be of so exalted a nature as to transcend our faculties ; and perhaps still harder to prove the plainness of the revelation on

the side of the common exposition, I am fully persuaded that while the Perfections of God are, as to our assent, deduc'd from their effects, they may in good measure, within certain bounds, as was before discours'd, be judg'd of by what is observable among Men. And as whatsoever is worthy, good, and valuable among our selves, is rightly own'd as an efflux and gift of God ; so whatsoever is preposterous, absurd, or disorderly, whatsoever is unworthy, base, or despicable in humane affairs, cannot without great indignity be believed of him ; and where we have no other ways of determining, such reasonings ought to be persuasive and decretory.

Now therefore, all this being said by way of Introduction to this and some following Arguments, let us apply it to the case before us ; and supposing, (which yet I need not allow) that the matter were indifferent on all other considerations, let us speak freely whether such a method, such time, and such proportion of the several parts as the Ordinary Scheme of the Creation sets before us, be in any degree so well contriv'd, and suitably dispos'd, as, I say not a Divine, but a meer Humane Architect may be suppos'd the Author of. I need not here give a particular account of the vulgar exposition of the first Chapter of *Genesis*: 'Tis sufficiently known as to the main parts of it. But the disproportions I would take notice of in it under this Head are these three ;

(1.) The length of the Day usually assign'd, is wholly disproportionate to the business done upon it.

(2.) When the Works of each of the other Days are single, distinct, and of a sort, the Third Day has two quite different, nay incompatible Works assigned to it.

(3.) And

(3.) And Principally the Earth with its furniture, how inconsiderable a Body soever it is, takes up four intire days, at least, of those six which were allotted to the whole Creation, when the Sun, Moon and Stars, those vastly greater and more considerable bodies, are crowded into one single day together.

(1.) The Length of the Day usually assign'd of Twenty four Hours is wholly disproportionate to the business done upon it. This plainly appears by the History it self, where, to omit other instances, the whole train in the generation or first production of Animals, has no longer a space afforded to it; when yet all experience shews, that a much longer is necessarily requir'd, and has obtain'd in all the subsequent Ages. Now I do not question but it will be confess'd by all, that according to the constant process of Nature, this time is utterly insufficient for this purpose: But what will be said is, that a Divine Power immediately interpos'd, and either form'd every thing in its grown and mature state; or at least accelerated and hasten'd the course of Nature, so as to enable her to perfect each Creature in so short a space; and that consequently no straitness of time ought to be alledg'd on this account. In answer whereto I freely grant, that God can produce all things in their most perfect state, in a moment; and if that could be prov'd to have been the method here, this exception were of no validity. But as on such a supposition 'tis strange that six intire and successive days should be requisite to, or pitch'd upon by an Infinite and Unlimited Agent; when the instantaneous Creation of the whole appears more agreeable to the Dignity and Power of the Creator; so I am pretty secure that this Hypo-

thesis, how common soever, is repugnant to the *Mosaick History*. The Sacred Penman does there ascribe indeed the Origin of every thing to the Divine Power; yet no otherwise than the like would be, and is done by the Holy Writers afterwards, nay by every body at this day; when yet the constant method of Generation is exactly observ'd. If any of us were ask'd who made us? We should soon answer, God; without the least imagination that we were excus'd from that nine months abode, and gradual growth in our Mothers Womb; which every one by the general Rule and Method of Nature is oblig'd to undergo. Which appears in the present case to be the intention of the Holy Writer, because he makes these very Animals productions of the Water and Earth, as well as the proper effects of the Divine Power; as has been observ'd already on another occasion. And those who deny this gradual Generation according to the course of Nature, must without reason recede from the Letter of *Moses*; and that when by so doing they render this Sacred History more difficult and unintelligible than it really is.

But if instead of immediate Creation it be said that 'twas only a supernatural acceleration of natural causes, without any other alteration of the process; which is I think the only probable evasion, and the fairest supposition of all other; I reply, That this is *gratis dictum*, without any foundation in the Scripture, and so as easily denied as asserted; it is introduc'd only to salve the shortness of time mention'd in the History, which will be prov'd hereafter to stand in no need of it; and it overthrows all attempts of accounting for this six days Creation in a rational and natural way; for if a miraculous power be allow'd

allow'd in a needless case, we shall be ever at a loss how far to extend it, and where mechanical causes ought to take place. On which considerations I take this extraordinary acceleration of natural causes to be, tho' not impossible, nor (were there any intimation or necessity of its interposition from the Sacred History) very improbable neither, yet in the present case, groundless, unnecessary, perplexing of the cause, and by no means a sufficient solution in the present Affair. Which being therefore thus answer'd, the Argument remains in full force, and the length of the days assign'd by the vulgar Hypothesis appears wholly disproportionate to the Works done therein; of which farther notice will be taken hereafter.

(2.) When the Works of each of the other Days are single, distinct, and of a sort, the third Day has two quite different, nay incompatible ones assigned to it. This is plain from the History, where the division of the Waters from the Earth, or the distinction of the Terraqueous Globe into Seas and dry Land, the first work on this Day, is succeeded by that of the production of the intire Vegetable Kingdom; contrary to the perpetual Tenor of the other periods of the Creation. How this comes about, or is accountable in the vulgar Scheme, I know not; and I believe the reason thereof is very little enquir'd into, and less understood. But because this whole difficulty will be urg'd against the shortness of days in the Vulgar Hypothesis, and clear'd in Ours, at their proper places hereafter, I shall wave the farther insisting upon it here, and proceed.

(3.) But principally, the Earth with its Furniture, how inconsiderable a body soever it is, takes

up four intire days, at least, of those six which were allotted to the whole Creation; when the Sun, Moon and Stars, those vastly greater and more considerable Bodies, are crowded into one single day together. Now in order to our passing a rational judgment in this matter, I shall take leave to represent to the Reader's view a short comparison or parallel between the Earth on one side, and the rest of the World on the other; and see what resemblance, correspondence and proportion there is between the former and the latter, either in its several parts, or the whole taken together; and this shall be done on such certain and undoubted grounds and principles as the late vast advancement of Natural Knowledge has afforded us; and will be more at large explain'd in the following Pages.

This Earth then, on which we live, though it be in diameter more than 8000 miles, and so a vast Globe, if compar'd with those Bodies we daily see, imagine, and converse withal, is yet one of the lesser of the primary Planets, and with *Jupiter, Mars*, and the other her fellows, revolves round the great Center of our System the *Sun*, in a years time. 'Tis an Opaque and Dark Body, as they all are, and in common with them borrows its light and heat from that glorious Body which we just now observ'd to obtain the center of their Orbits; without which it, as well as the intire Chorus of the other Planets, must be soon reduc'd all to one dark heap of matter, far beyond the description of the old caliginous and unprofitable Chaos, and in no capacity of ever emerging out of that horrid and frightful state. In dignity, if our Earth expect not to come the *last*, yet is she so exceeded, in all things that might seem Characters thereof, by
several

several of the rest, that there can be no manner of claim to the *first* Place. If she have a secondary Planet, the *Moon*, for her attendant (tho in truth she is at least as serviceable to that Planet, as that Planet is to her); *Jupiter* has certainly four; and some good Glasses have discover'd five about *Saturn*; who however is not wholly destitute, as all Astronomers confess. The density and place of the Earth is pretty near the middle of the Planets, and as she exceeds, and is higher than some, so is she exceeded by, and lower than others in those respects. Her own Secondary Planet, the *Moon*, has an Air much more homogeneous, pure, and transparent, than she at present enjoys; and in all probability free from Winds, Clouds, Storms, Tempests, Thunder, Lightning, and such other irregular and pernicious Effects, which render our Atmosphere so contagious and pestilent to the Inhabitants of the Earth. In which circumstances the generality of the other Planets imitate the Moon, and render our miserable Condition the more remarkable and sensible; as appearing thereby almost singular. Our days and nights are longer than those of some, and shorter than those of others of the Planets. The figure of the Earth is nearly spherical, as is that also of the other Heavenly Bodies; its surface unequal, with Mountains and Valleys, as well as that of the rest, especially the Moon's, appears to be. Only 'tis observable that the last, though much less in bigness, has her Mountains higher than we on Earth. The Sea and Land, Mountains and Valleys, and other such corresponding *Phænomena* of the Moon, shew, that that small Planet is not nearer our Earth in place, than in quality and disposition also. If we compute the true mag-

Isa. xxxix.
15, 17.

nitude or quantity of matter in the Earth, it will appear that she is not the 60th part so big as *Jupiter*, nor the 30th as *Saturn*, nor the 60000th as the Sun. So that she is very inconsiderable, if compar'd with the rest of the *Solar Vortex* only; but if with the intire Universe or Systems of the first Stars, in the elegancy of the Prophetick Expressions, *as a drop of a Bucket, as the small dust of the Balance, yea less than nothing, and vanity*. Insomuch, that to all those remote Systems of the Heavenly Bodies, this Earth, with all its fellow Planets, are no more visible than those which, 'tis probable, revolve about any of them, are to us in these our Planetary Regions. And as we usually little think of those invisible Globes, so any of their Inhabitants never once imagine that there is such a Planet as ours (about which we make such a mighty stir) in the whole World. As to the main use of this Earth, 'tis to afford habitation to a sinful and lapsed Race of Creatures, of small Abilities or Capacities at present, but of great Vices and Wickedness; and is esteemed, as far as appears, in its present constitution so peculiarly and solely fit for them, that when they are gone, or their Dispositions and Faculties reform'd and improv'd, a better scene of Nature, (*a new Heaven, and a new Earth,*) is to be introduc'd, for such better and more noble Creatures. The Old one, which now obtains, being, it seems, only a sort of Prison or Confinement, which is to be our Lot whilst we are sinful and miserable, but no longer.

And is this the only Darling of Nature, the prime Object of the Creation and Providence of God? Can such a Globe's original, nay, of the external and visible Parts of it only, claim four parts of six of that entire space, which the Wisdom

Wisdom of God allotted for the Formation of all things in the whole World, while the Origin of the Sun, Moon, and numberless Systems of Stars has only a poor single part allotted to it? Must the expanding the Air between the Earth and the Clouds, be thought to equal the disposal of all those Cœlestial Bodies into their several Regions? and the producing a few Fish and Fowl, be a weightier concern, and require more time than the replenishing all the other habitable Worlds with Beings suitable to their several Constitutions? Will a wise Builder bestow twice as much time in decking and adorning of one By-closet of inferior use, and that only to some of the meanest Servants too; as of the Royal Palace, with all its stately Rooms and Apartments, intended for the King himself, and his Courtiers? Should we hear of such strange Actions, and disproportionate Procedure among Men, we should not be able to induce our selves to give credit thereto. But it seems Suppositions ten thousand times more disproportionate and unaccountable, when ascrib'd to God Almighty, are easily believ'd. So far can Ignorance, Prejudice, and a misunderstanding of the Sacred Volumes carry the Faith, nay, the Zeal of Men! and to such a mean Opinion of the most glorious and perfect of Beings are we thereby reduc'd, that as if we were not content to think him such a one as our selves, but intended to depress him below the very meanest of us, we venture with confidence and eagerness to ascribe to him that disproportionate, unequal, and unaccountable disposal of the Works of Creation, which the simplest Artificer could not bear the Imputation of!

It must here be confess'd, That such Notions of the *Mosaick* Creation, as I now oppose, having begun, or at least been chiefly establish'd and propagated when the *Aristotelean* Philosophy, and *Ptolomaick* Astronomy were believ'd; those who have embrac'd them till this Age were less absurd, and nearer to some tolerable degree of probability. For so long as the Earth with its adjoining Elements was suppos'd the Center and Basis of all the World; while the distance of the Heavenly Bodies was believ'd to be, comparatively to what we now find, very small and inconsiderable; and all their Motions perform'd about us their proper and immovable Center; while the whole Series of Spheres above (tho' the several distinct ones mov'd the contrary way by their own peculiar Motions) was in twenty four hours constantly hurried from *East* to *West* by the *Primum Mobile*, on purpose to cause Day and Night to us below; while Comets were esteem'd Exhalations from the Stars, and sent only at certain Seasons to affright Mankind with their fiery Tails, and then to be dissipated and vanish into Vapours again; while the Sun and Stars, in the Opinion of the Philosophers themselves, were nourish'd by the Steams from our Earth; and while the last named were either stuck in one Spherical Superficies as the fix'd Stars, or fastned in their Solid Orbs, like a Nail in a Cartwheel, as the Planets, and no other use imagin'd but to twinkle to us in Winter Evenings, and by their Aspects to forebode what little Changes of Weather, or other Accidents were to be expected below; while no other habitable World was dream'd of than this Globe of Earth; no other Animals once conjectur'd at, besides those on the face thereof; while Mankind was look'd on

as the sole Lord of the Creation, and Him for whose sake all other Creatures in the World were made; and while 'twas commonly granted that, as all things, the visible Heavens and Earth, with their intire Furniture began with him; so at the Conclusion of his Succession, or the period of Humane Generations here, must they for ever cease and be annihilated; While all this, I say, was the current Philosophy, 'tis not very surprizing that the *Mosaick* History we are now upon was understood in the Vulgar Sense, and seem'd not wholly disagreeable to the presumed Frame of Nature; and 'twas not hard to believe, that this Earth and its Inhabitants, in the Opinion of the World, the main and principal concern of all, and that to whose uses every thing else intirely serv'd, had the principal care bestow'd upon it, both in its Original Creation, and its subsequent Changes and Revolutions.

But tho' such a Scheme, and such an Apprehension were passable enough in the days of our Forefathers; 'tis by no means so now. Those greater degrees of Knowledge which the Providence of God has in this Age afforded us, make such Opinions intolerable in the present, which were not so in the past Centuries. 'Tis now evident, That every one of the Planets, as well as that on which we live, must have a right in its proportion to share in the care of Heaven, and had therefore in all probability a suitable space or number of Days allow'd to its proper Formation; much what the same Separations of Parts, Digestions, and Collections, being no doubt to be suppos'd in the Original Formation of any other, as in that particular Planet, with which *Moses* was concern'd. And if one or two on account

count of their smallness, might be finish'd in less; the rest on account of their bigness, from a parity of Reason, would take up much more than that six days time which was spent in our Earth's Formation.

And let the *Reader* judge, if it be so impossible to reduce the Planets alone within the fourth days Work, how much more so it will be (in case we allow degrees of impossibilities) to reduce thither that vast noble and useful Body the Fountain of our Light and Heat, the Sun; and still in a prodigious degree more so, to include the immense and numberless Systems of the fixt Stars; among whom when the Sun is but one, and perhaps no bigger than the rest; (and consequently to have in reason but an equal portion of time with them allotted for its Origination;) It must, tho' above Sixty thousand times as big as the Earth, while the Earth takes up four intire ones, be thrust into the Corner of a single Day; Corner, did I say? rather Minute, nay, Moment of a Day; and 'tis uncertain whether even that pittance of time can fairly and separately be allow'd to it. So that one need not fear to assert, That he who should affirm the Divine Power to have spent four entire Days in the Formation of a Fly or Worm, nay, of a single Plant or Herb; and but one in the Formation of the Terraqueous Globe with all its Parts, Regions, and Furniture, would be less unreasonable than some Expositors now are, and more observe Decorum, Fitness, Agreement, and Proportion, than they do in the Vulgar Interpretations of the *Mosaick* Creation. And I need not be afraid to call all that Astronomy and Philosophy are Masters of, to attest the fairness of such a Comparison. And can any one who is sensible of this, and entertains no other than
great

great and worthy Thoughts of his Alwise Creator, embrace so fond and so strange an Opinion?

And if the Reader will pardon a short Digression, and give me leave to speak a great Truth on this occasion, I cannot but observe, That 'tis not the genuine Contents of the Holy Books themselves, but such unwary Interpretations of them as these, which have mainly contributed to their contempt, and been but too Instrumental to make 'em appear Absurd and Irrational to the Free Reason of Mankind. For when Men found that the Scriptures, according to the Universal Sense of Expositors, ascribed such things to God, as their plainest reason could not think compatible to a Wise Man, much less to the All-wise God; they were under a shrewd Temptation of thinking very meanly of the Bible it self, and by degrees of rejecting it, and therewith all Divine Revelation to the Sons of Men. How fatally this Malady hath spread, of late especially, I need not say; and tho' I fully believe the main stroke or step, as to the generality, be Vicious Dispositions and a Debauched Temper, yet how far such Ill-contriv'd, Unskilful, and Unphilosophical Interpretations, or rather Misrepresentations of Scripture, particularly relating to the Material World of which we are now speaking, may have contributed to so fatal and pernicious an effect, deserves the most serious and sober consideration.

This Mischief is not to be remedied, nor the Veneration due to the Sacred Volumes retriev'd by an obstinate maintaining such strange opinions as those here refer'd to, by patronizing the same with Divine Authority, and then making vehement Invectives against such (as many unskilful, yet good men, are ready to do) whose only fault is this that they can no more be induc'd to believe

believe what is plainly unworthy of, and unsuitable to the Divine Perfections, than what is evidently contradictory to Divine Revelation. Wise Men would rather set themselves carefully to compare Nature with Scripture, and make a free Enquiry into the certain *Phænomena* of the one, and the genuin Sense of the other; which if Expositors would do, 'twere not hard to demonstrate in several such cases, that the latter is so far from opposing the truths deducible from the former, or the common notions of Mankind, that 'tis in the greatest harmony therewith; and in those cases (where the thing mention'd is within the sphere of human Knowledge) no less accountable to the reason, than enforc'd on the belief of Mankind. And I persuade my self if there were a careful collection made of the Ancient knots and difficulties in the several parts of the Bible, with relation to such points as we are upon, or any others of a different nature; and how very many of them, as preludes and pledges of the rest, are now intirely clear'd, or might easily be so; it would more contribute to the recovery of the Ancient Honour, and due Esteem of the Sacred Scriptures, than all the most Zealous and general Harangues from some popular Topicks, either for them, or against their Contemners, the loose *Deists* and pretended *Socinians* of this Age. For my own part I cannot but profess, that tho' I be very nice and tender in the reasonableness of my Faith, and desirous to admit nothing but what agrees to the Divine Attributes, the common notions of our Souls, and the *Phænomena* of Nature; yet upon an Impartial Enquiry into some of the most perplexing difficulties occurring there, I have obtain'd so great a Measure of satisfaction about them, that my scruples

scruples now intirely cease, and I cannot doubt either of the Truth or Divine Authority of the Scriptures. I do not mean, that all the difficulties are in particular vanish'd and perfectly clear'd to me : That is what is scarce to be hop'd for in this World : But I have so frequently met with fewer difficulties in the consideration of the Books themselves, than in the common Interpretations, and those very Comments which ought to assist 'em : And in so many, and those most remarkable Points of all, have met with such clear and plenary, tho' unexpected satisfaction, that I have all imaginable reason to believe the rest equally capable of the same, and to remain constant in this assurance, That 'tis the ignorant or foolish Expositions of Men, not the natural and genuine Sense of the Words themselves, that makes us imagine Scripture, Reason, and the Nature of Things irreconcilable or contradictory to one another. And I hope the instances he will meet with in the following Theory, will go a great way to persuade the unbiass'd Reader of the same Truth; and to convince him, that greater satisfaction is to be look'd for from the view of God's own Books of Nature and Scripture, than those of any Men whatsoever. Whatever incompetent Judges may say, nothing will so much tend to the vindication and honour of reveal'd Religion, as free enquiries into, and a solid acquaintance with, (not ingenious and precarious Hypotheses, but) true and demonstrable principles of Philosophy, with the History of Nature, and with such ancient Traditions as in all probability were deriv'd from *Noah*, and by him from the more Ancient Fathers of the World. From which *mediums*, what surprizing and unhop'd for light may be given to some famous portions of the Holy Scriptures, the following

following Pages will, 'tis hop'd, afford some convincing Instances, and prove sufficient to take away mens ungrounded Fears and Apprehensions in such matters: And, by the Divine Blessing, appear a seasonable Attestation to the Certainty and Authority of those *Lively Oracles* on which our Happiness in this, and the next World does so vastly depend. But I must leave this digression, and proceed,

VI. The Vulgar Scheme of the *Mosaick Creation*, besides the disproportion as to time, represents all things from first to last so disorderly, confus'dly, and unphilosophically, that 'tis intirely disagreeable to the Wisdom and Perfection of God.

And here I might justly Appeal to the Conscience of every careful Reader, even tho' his Knowledge of the true System of the World were not great, whether the vulgar account has not ever seem'd strange and surprizing to him? But if he were one Philosophically dispos'd, and allow'd himself a free consideration of it; whether it has not ever been the most perplexing thing to his thoughts that could be imagin'd? 'Tis well known how far this matter has been carried by Wise and Good Men; even to the taking away the literal, and the resolving the whole into a Popular Moral or Parabolick sense: And under what notion this History on the same account has appear'd to others, of no less free, but less Religious Dispositions and Thoughts, I need not say: What is indeed matter of doubt and perplexity to pious men, being unquestionably to the Loose and Profane, the Subject of Mirth and Drollery, and the sure encouragement to Atheism and Impiety. But I shall not
content

content my self with this general reflection; but instead of prosecuting such a Discourse any farther, shall assign such particular instances of the irregular and unbecoming procedure in the vulgar Scheme of the Creation, as are plainly disagreeable to the Divine Wisdom, and unsuitable to the nature of things.

(1.) Bodies Alike in Nature have here an unlike Original.

(2.) Bodies Unlike in Nature have a like Original.

(3.) Bodies most considerable in themselves, have the most inconsiderable accounts given of them.

(4.) No Bodies but the Earth have either time for, or particulars of, the formation of the several parts assign'd.

(5.) The Light appears before its Cause and Fountain the Sun was made.

(6.) The Excavation of the Channel of the Ocean, and the Elevation of the Mountains is unnatural and indecent. Of each of which I shall say but a word or two, and then as briefly argue from them.

(1.) Bodies Alike in nature, have an unlike Original. Our Earth is one of the Planets, and in all reason belonging to their formation; yet is she the Subject of the Second, Third, Fifth, and Sixth days works, while the rest are included in the Fourth Day.

(2.) Bodies Unlike in nature have a like Original. The Sun, a glorious Body of Light, with his Fellows the fixt Stars, are join'd in the fourth day with the Opaque and Dark Globes of the Planets.

F

(3.) Bodies

(3.) Bodies most considerable in themselves, have the most inconsiderable accounts given of them. This is very obvious in that mighty adoe about our poor Earth, while the vastly greater and nobler Bodies of the Sun and Stars are scarce taken any notice of. And how disproportionate such a procedure is, the comparison already made of the Earth on one side, with the rest of the World on the other, does more than sufficiently demonstrate.

(4.) No Bodies but the Earth have either time for, or particulars of, the formation of the several parts assign'd. For when four days are wholly taken up with the particulars relating to our Earth; the division of its Aerial from its Earthly Waters; the distinguishing the latter from the dry Land, and draining 'em into the Channels of the Seas; the growth of Plants; generation of Fish, Fowl, and Terrestrial Animals; and at last the Creation of Man, with several circumstances relating to him, and the other Creatures; not a syllable as to the particulars of the rest of the World. Light is only commanded to shine on the First Day; and the Heavenly Bodies made on the Fourth, and there's all, as to themselves, which occurs here.

(5.) The Light appears before the Creation of the Sun, from whence it is deriv'd: That being the Work of the First, This of the Fourth Day. Which how Philosophical and Accountable 'tis, let the Reader judge.

(6.) The Excavation of the Channel of the Ocean, and the Elevation of the Mountains, is unnatural and indecent. For when the Earth was at first even, and cover'd with Waters, Expositors imagine, that God, as it were, digg'd a vast Channel for the Ocean, and heav'd away the
the

the Earth, and plac'd it on all parts of the Globe, to make the Mountains. Which how indecent it is, I had rather leave to the judgment of the Reader, than stand here to exaggerate; especially where the naked representation of the thing it self is a sufficient exposing thereof to free Thinkers.

These obvious Remarks on the vulgar Scheme of the Mosaick Creation (to omit the passing by of the intire invisible World, whether within or without the surface of the Earth, whether corporeal or spiritual) are, I think, sufficient demonstrations that 'tis a very distant one from the true nature of things; and such as is both unworthy of the Writer and Author of the Sacred History. Whoever will take the pains carefully to consider the System of Nature, and compare it with these Remarks, and the common Opinion of the proper Creation of all things in the six Days Works, will not, I believe, be at a loss for Arguments to over-turn the old, and to prove that a new Theory is to be enquir'd after, and a narrower World to be expected in the First Chapter of *Genesis*, than has generally been.

But Before I conclude this Head, I must here observe, that the consideration of these matters has had so great influence on our late most Excellent Commentator on *Genesis*, that tho' he keep more strictly to the letter of *Moses* than others, yet he finds occasion and room for these four great Concessions, no less contrary to the vulgar, than approaching to the present Account of the History of the Creation.

Bishop of
Ely.

(1.) He is willing to allow that *Moses* meddles not with the intire Universe, but with the Planetary System only.

F 2

(2.) He

(2.) He allows the Creation of the World to have been over before the six Days Work begins.

(3.) He grants the same six Days Works to be the regular and orderly reduction of a confused Chaos into a habitable World, without any strange Miracles in every part.

(4.) He supposes, that for a considerable time before the six Days Work began, there were such preparatory agitations, fermentations and separations or conjunctions of parts, as disposed the whole to fall into the succeeding method, and introduce the six Days Productions following.

Which Concessions of so great a Man and excellent a Commentator, as they argue his sense of the necessity of receding from the vulgar Hypothesis, so they, I confess, lessen and diminish the difficulties in this History. *Lessen*, I say, and *diminish*; not take them away. For besides the want of any foundation in Scripture, as far as I see, for the distinction between the fixt Stars and Planets; the Arguments I have all along urged, reach, and are fram'd with regard to this limited Hypothesis also; and, with those yet to come, are I think more than sufficient to my purpose still, and will demonstrate the unaccountableness of the History of the Creation even on this, tho' much more on the common Interpretation.

VII. The *Mosaick* Creation does not extend beyond this Earth, because the alone final cause of all therein contained, is the advantage of Mankind the Inhabitant thereof.

Now

Now that the final cause of all the particulars mention'd in the History before us, is here rightly assign'd, is not only visible in almost every verse of it, and in the places of Scripture afterwards referring to the same thing; but commonly acknowledg'd, nay contended for, by the Patrons of the vulgar account: So that I shall here take it for granted. But then as to the consequence, that therefore the Creation is no farther to be extended, or at least not so far as here it must otherwise be, to the Sun and Planets; nay with the most, to the innumerable Systems of the fix'd Stars; 'tis to me so natural and necessary, that methinks 'tis perfectly needless to go about the proof of it. That so vast and noble a System, consisting of so many, so remote, so different, and so glorious Bodies, should be made only for the use of Man, is so wild a Fancy, that it deserves any other treatment sooner than a serious confutation: And one may better think silently with ones self, than with due deference and decency speak, what naturally arises in ones Mind on this occasion.

If 'tis an instance of, or consistent with the Divine Wisdom, to make thousands of glorious Bodies for the sole use of a few fallen and rebellious Creatures, which were to live for a little while upon one of the most inconsiderable of them! To create an innumerable multitude of Suns and Planets, and place them at prodigious distances from us and from one another, (the greatest part of which were never seen till the late invention of the Telescope; and of such as are visible, the Sun excepted, the single Moon, as despicable a Body as it is in comparison to the

most of the others, is much more beneficial to us than they all put together) for the meer convenience of one little Earth! If 'tis Wife and Rational to make the Sun more than Sixty thousand times as big as that Globe it was to serve, only that it might be plac'd above Fifty millions of Miles off; (for in a nearer position it would have scorch'd and burnt, instead of warm'd and invigorated the Earth) when a small Fiery Ball plac'd near us would have done as well! To make a vast number of Planets, (every way as capable of Creatures of their own) only for the sake of us on Earth; that we might in the night time view and calculate their positions and motions! To place five secondary Planets about *Saturn*, and four about *Jupiter*, that after for more than Five thousand years no one had dream'd of their Existence, a few Astronomers might, with their Glasses, peep at them, and observe their periods! To appoint the orbit of one of the primary Planets (*Mercury*) so near the Sun, that not one in a hundred ever gets a distinct view of him all his Life! To move the Comets in orbits so extremely large and elliptical or oblong, that by their distance from the Planetary Regions most part of each revolution, they should be so little observable, that the World were just ending before they could be known to be other than Masses of Vapours soon conjoin'd, and as soon dissipated again, and now not visible the hundredth or perhaps thousandth part of their periods! To make all this immense frame of the Heavenly Systems; so Glorious, August, and Magnificent, and so deserving of our Contemplation; and yet withal to frame
our

our Eyes and Sensations in that manner, as to be incapable to discern or imagine any thing thereof in comparison! so that had not Astronomical observation rectify'd our mistakes, we must have thought the whole World not near so big as one of its least bodies really is; and all this without any farther prospect, or nobler design than the single Use and Advantage of Mankind! If, I say, all this be the effect of Ineffable Wisdom and Contrivance, and worthy to be believed of the All-wise God; 'tis scarce possible to suppose, in the Material World at least, what will not be equally so. And such strange and astonishing incongruities, which among poor Mortals would unquestionably argue the most extravagant degree of folly, in the Deiry, *Blessed for evermore*, must be Arguments of unbounded Perfection, and Effluxes of Infinite Reason, Wisdom, and Prudence. Certainly one ought to be very well ascertain'd of the sense of Scripture, before from thence one venture to assert such unreasonable opinions.

Nay even tho' the Sense of Scripture seem'd exceeding favourable to any Scheme of this Nature, yet in that case, a considering Person would chuse rather honestly to own his Ignorance, and confess he did not understand the matter, than be positive in that which is so plainly repugnant to the Divine Perfections.

And this (to digress a little) is methinks the only safe and rational way of procedure in those cases, where we cannot reconcile the Divine Attributes, the *Phænomena* of the World, or the Reason of our own Minds, to the Revealed Word of God, *viz.* In the first place carefully

to consider the Texts concern'd, and whether they are not misapply'd; if on such a consideration we cannot find them to be so, and that without a forc'd, unnatural and violent sense be put upon plain words, the difficulties still appear insuperable; 'tis then our Duty and our Wisdom to imitate the *Jews* in that admirable and pious Proverb in these cases, *Cum Elias venerit, solvet Nodos*. To sit down and rest satisfied with this expectation, That when the Divine Wisdom sees it a fit time, all will be assail'd; and every one of the Knots of Scripture and of Providence untied. To stay with patience for those *idiot times* peculiar seasons, which with regard both to the improvement of Knowledge, and unvailing of Mysteries, no less than the fulfilling Decrees, *the Father has put in his own power*. And as the Old *Jews* should in vain have attempted the intire understanding of their own Ceremonial Law till the *idiot times*, the coming of Christ; so I believe we must not expect the clearing of every Text of Scripture, and of every secret of Providence, till the *idiot times*, *the time appointed of the Father*. Till then we ought not, where insuperable difficulties occur, by a bold determination to run counter to God, either in his Word, whether engraven on our Minds, or written in the Bible, or his Works visible in the World.

'Tis hard to say whether those dishonour God most who embrace Doctrines, suppos'd deducible from Scripture, tho' plainly absurd and unreasonable in themselves; or those who venture to deny or at least wrest and prevaricate with the obvious meaning of such Texts whence
those

those Doctrines us'd to be infer'd. Both these methods of procedure are bold and dangerous; Effects of our own Pride, and too high an opinion of our proper apprehensions and abilities, and of sad consequence to our selves, to others, and to Divine Revelation. There is a third or middle way, which, tho' an instance of real self-denial, we both may and ought to take. *Let God be true, but every man a liar.* Our Understandings are finite, our Capacities small, our Sphere of Knowledge not great. We depend on God Almighty as to what we *know*, as well as what we *have*, or what we *are*. 'Tis possible it may not yet be the proper season for unravelling the Mystery, and so the requisite helps not yet afforded; our own unskillfulness or prejudices; some false notions or precarious Hypotheses we have embrac'd; our misunderstanding the nature of the Scripture Stile; a mistake of a Copy; the ignorance of the various stages and periods of the World to which the particulars belong; with many other such circumstances, may justly be supposed the occasions of our difficulties, without calling in question either the truth of our humane faculties, the Attributes of God, the *Phænomena* of Nature, or the genuine sense of the Holy Scriptures. And truly were I asked in such a case how I could satisfy my self, or resolve the point; I could not more properly answer than by alluding to the *Jewish* Proverb before-mention'd; and alledging that, *Cum Messias venerit, Solvet Nodum*; till which time I might desire leave to defer my farther answer.

And here from a general View of what has been said on these three last Arguments, we cannot

not but observe, into what Erroneous Extremes Good Men have been betray'd, with relation to several main difficulties occurring in the Sacred Writings : While, from a profound respect to the revealed Word of God, the most were willing to lay aside the use of their own Reason; and others from a no less veneration for the Divine Attributes, and regard to those common notions which God had implanted in their Souls, were willing to indulge too great a liberty in the Interpretation of Scripture. The former, being generally Pious and Devout Souls, but little vers'd in contemplation, or the improvements of natural knowledge, were dispos'd to receive all that a Vulgar and Religious, tho' less Wary and Prudent Exposition, should recommend to their Assent. The latter having added to their Piety and Vertue, a careful enquiry into Nature, and a freer exercise of their Humane Faculties, and observing how heavy imputations some common Interpretations laid on the Divine Majesty, how disagreeable they were to External Nature, as well as the Reason of Mankind; were carried too far on the other hand; and when the latter were secur'd, were not proportionably solicitous about the former : I mean, so that nothing but what Reason, the Attributes of God, and the System of the World allow'd, were admitted, these did not take a proportionable care that the natural sense of Scripture were equally provided for.

What I would here further observe, is, the equal Condition and Deserts, but the unequal Reputation and Fate these two sorts of Men have generally met with in the Christian World.

Their

Their Characters to me seem so correspondent, and their contrary Mistakes so equally wide from Truth, equally derogatory to the Honour of God, and yet equally proceeding from a Religious Principle, a desire to secure the Interest of Divine Revelation; that to me they seem to deserve the same Respect and Commendation for their sincere Endeavours, and pious Intentions; the same Pity and Pardon for their Errors and Mistakes. But it has happen'd much otherwise; for by reason of the little Leisure and Abilities of the generality of Teachers to cultivate their own Reason, or make any successful enquiries into the Natural World; the former sort being in themselves most numerous, and as must needs happen, having the most part of Christian People on their side, did with Zeal and Earnestness decry the latter; and tho' themselves on one side did as highly Dishonour the Sacred Oracles, as the other on the opposite, yet they vehemently laid *that* Imputation on the latter, and decry'd them as secret Underminers of that Word of God they pretended more rationally to explain. 'Twere easy to give Examples in this case, but I shall content my self with one concerning those very Histories of the Creation and Deluge, which I am to explain in the following Theory.

'Tis well known what great, and hitherto insuperable Difficulties these Histories have involv'd in them, to the general view of Mankind; and how much still greater, and still more insuperable those Difficulties appear'd to Philosophick Enquirer's, who came more nicely to consider them, and compare what was asserted in the Holy Scriptures, with the true Frame and System of
External

External Nature. The consideration of these things so affected a great and good Man, that he resolv'd on a noble Attempt, and undertook to clear those Points, and shew that the temporary Origin of the World from a *Chaos*, and a Universal Deluge, were rational and accountable Theorems, and thereby take away that Blot and Obstacle, which the seeming impossibility of these things laid in the way of ill-disposed Persons. In which matters, he employ'd his utmost skill in the best System of Philosophy then known in the World; his most diligent researches into the sacred and prophane Accounts relating to those anciently more known *Phænomena* of Nature, together with such other helps as his own excellent Abilities could afford him; and that as to several main and principal strokes, to very great Satisfaction, and to the very remarkable Illustration of the Holy Scriptures. But in the Prosecution of this Scheme, being so vast, so noble, so uniform, so coherent, and withal, so new and surprizing, it at last appear'd that such his Theory would not in several Particulars accord with the letter of Scripture. This unhappy dissonancy the Theorist was soon sensible of, and no doubt not a little concern'd about. In which streight, seeing no possible way of securing the main Points without so unpleasing a Concession; instead of resolving to rest satisfied in the natural Sense of Scripture, and acquiescing in the Divine Revelation, till farther means of clearing the whole should offer themselves, which I think is a good Man's Duty in such cases, he ventur'd to suppose that the Sacred Books were not always to be so literally and naturally understood, as was generally

nerally believ'd hitherto. He alledg'd, That considering the mean Capacities of the *Jews*, which were not capable of such Points of Philosophick Truths, considering the most ancient way of conveying (or rather of concealing) sublime Theorems, by Parables, Fables, and Hieroglyphicks; considering the Scripture Stile in some other cases, very much different from the present plain and explicit way of Discourse, and nearer a-kin to that most ancient Method; considering the main end of the Holy Writings, the benefit of the Moral World, seem'd not to require a strict adherence to truth in every circumstance relating to the Natural; nay, rather enforc'd a receding from it in some cases; considering, lastly, That all Ages had in vain endeavour'd to clear these Points according to the strictness of the most obvious Sense, and that the greater Improvements in Philosophy seem'd but to render them still more unaccountable; considering, I say, all these things, He suppos'd that the Holy Writers only secur'd the Fundamental and General Verities, involving the rest under, and explaining the whole by a way of speaking, which was Mystical and Mythological; rather popular than true, and fitted more to the needs of Men, than to the reality of Things. This is, I think, a fair and full Account of the Opinion, and a genuine Explication of the occasion of this unhappy Slip of our late Excellent Theorist; and such an one I acknowledge 'tis, as in it self, has no solid or necessary Foundation, is of ill consequence to the Authority of the Holy Scriptures, and dishonourable both to their Penmen, and chiefly
to

to their Principal Inditer, the Blessed Spirit of God.

In which Censure, if the Learned Author think me too free, or too severe, he will, I hope, see reason to excuse, and not to be displeas'd with me, when I have own'd, as I must ingenuously do, That *in accusing him, I condemn my self, for I my self, in great measure, have thought the same things.* For I cannot but with the Theorist confess, That the Difficulties in the Vulgar Expositions were so great; such absurd Incongruities ascrib'd to God by them; the true System of the World did so disagree, and increase the Scruples; the main Histories themselves appear'd so impossible to be any other way secur'd; Several of the Accounts given by the Theorist were in the main so ingenious, so probable, and so agreeable to Ancient Tradition, upon a cursory Consideration; and the Arguments before-mention'd seem'd to me so considerable, that 'twas not easy for me to deny all Assent to that very Conclusion, which yet on farther Enquiries and Discoveries, I think not unworthy of the foregoing Censure. And I should esteem it a very signal happiness, if, as *that* Theory was so instrumental in drawing me into the foremention'd Mistake; so *this* might be fortunate enough to persuade the Author of that, of the opposite Verity, in which the Discoveries it contains have fully settled my own Mind, and are, I think, sufficient in themselves to settle the minds of others.

But to wave these too ambitious Expectations, I cannot but say so much in behalf of that Learned Theorist, That as he justly deserves the
highest

highest Commendations for so generous and worthy an Attempt; for the great Illustration he has given those Histories from the most Ancient Traditionary Learning; and the Light afforded to the Holy Scriptures in several, and those very considerable Points: So he has, I think, reason to expect an easy Pardon where he was not able to do the same; especially, when not only Pardon, but the freest Praises are bestowed on those, who as I before observ'd, equally have expos'd the Honour of God, and equally derogated from the Reputation of the Sacred Writings by their unwary and unskilful Interpretations. A good Man, who to the highest Veneration for the Perfections of the Divine Nature, has joyn'd a careful Enquiry into the Frame of the World, and a free, but modest use of those Faculties God has given him; and has withal exactly consider'd the undoubted evidence for the Divine Authority of the Scripture; ought to be, and will be as tender of believing a Sense which is contrary to his innate Notions, to the Perfections of God, and the certain Observations of Nature, as of that which puts a force upon the Words themselves, and renders them meerly Popular and Mythological. And by consequence either those who so frequently and zealously do the former, are to be condemn'd, which yet the Christian World has been far from doing; or those who have been forc'd upon the latter, ought to escape any greater Severity. For my own part, as in such difficult Cases, I easily pass over the Mistakes, and value the Truths discover'd by any well-dispos'd Persons; which is but a due Debt owing from one fallible Creature to another:

ther : So I humbly bless God, the Author and Giver of all good things, for that Light he has afforded me (and which, by the Divine Blessing, I hope the following Pages will afford the Reader) in these matters; by which I am convinc'd of the no-necessity of opposing the *literal* to the *true*; the Obvious and Natural, to the Rational and Philosophick Interpretations of the Holy Scriptures; and shall chearfully wait for that happy time, when all Doubts being remov'd, and all Objections prevented by the Improvement of our Knowledge, and the Conduct of the Divine Providence, Reason and Revelation, shall reciprocally bear Witness to, and embrace each other; when no one shall be able to pretend to the one, but he who is equally acquainted and satisfied with the other; and the whole reasonable Creation shall unite their Hearts and Tongues in Hymns to God. *All thy Commandments are faithful. Thy Statutes are right rejoicing the heart. Thy Judgments, O Lord, are true and righteous altogether. Righteous art thou, O Lord, and just are thy judgments. Great and marvellous are thy works, O Lord God Almighty! Just and true are thy ways, O King of Saints! But to return from this Digression, and to proceed.*

Psal. cxix.

86.

Psal. xix.

3, 9.

Apoc. xv.

3.

VIII. I prove the *Mosaick* Creation extends no farther than our Earth, and is of no other Nature than is assign'd here; because neither the Intentions of the Author require, nor the Capacities of the People could bear either a strictly Philosophical, or a truly Universal Account of the Origin of things.

The

The designs of *Moses*, the inspired Penman, or rather of that Blessed Spirit which inspir'd him, in this History of the Creation, were not the gratifying the Curiosity, or satisfying the Philosophick Enquiries of a few elevated Minds, but of a more general and useful Nature; namely, To inform the *Jews*, and the rest of the World, that all the visible Frame of Heaven and Earth was neither existent from all Eternity, nor the result of blind Chance, fatal Necessity, nor unaccountable Accidents, but the Workmanship of God Almighty. To make them sensible that every Being they had any knowledge of, was deriv'd from, and subject to that *Jehovah* whom they worshipp'd, and that in him *themselves* with all their fellow Creatures in the open Air, on the wide Earth, or in the deep Seas, *liv'd, mov'd, and had their Being*; who therefore must needs be the Governor and Ruler of them all. To affect their Minds, by this means, with the awfulest Veneration for the God of *Israel*, and inspire them with a just Gratitude to him for all their Enjoyments, who had not only created this Earth for Mankind, and furnish'd it with various Creatures for their use, but beside these Terrestrial, had made the very Celestial Bodies subservient to their Necessities. To demonstrate the Original Goodness and Perfection of things, and that therefore whatever was Evil must have been the consequent of Man's Fall, and not of God's primary Introduction; and thereby to teach men Humility, and raise their abhorrence of Sin, the cause of all their Miseries. To shew them the unreasonableness of all sorts of Idolatry, or of the Worship of any visible Beings, tho' never so useful or glorious, by assuring them they were all in common the Creatures of God,

Acts xvii.
28.

and all their Influences, of what kind soever, intirely deriv'd from him, and under his disposal. In short, the main design was to secure Obedience to those Laws he was about to deliver from God to them, by giving them the greatest and justest *Idea's* of their Legislator, the *Almighty Maker of Heaven and Earth*.

These were, I suppose, the principal Reasons of thus recording the Creation of the World, and these Reasons made a particular Account of the visible Parts of this Earth, with all its Furniture, that was observable and expos'd to their daily view, necessary and expedient; nay, they enforc'd some kind of mention of the Heavenly Bodies, so far as they were concern'd with us below, and so far as to shew, that God originally created them, as well as the more ordinary Bodies on the Face of the Earth. All this was but proper and necessary in order to the foremention'd purposes. But why a Natural and Philosophical Account of the primary Formation of such remote and different Systems of Bodies, whose real Bigness, Distances, Natures, and Uses, abstractedly consider'd, never came into Mens thoughts, nor were once imagin'd by them, I cannot so easily tell.

Especially, if it be consider'd, That the Capacities of the *Jews*, to whom *Moses* peculiarly wrote, were very low and mean, and their Improvements very small, or rather none at all in Philosophick Matters. 'Tis not to be imagin'd that an intire Account of the Origine of the whole Frame of Nature (the noblest and most sublime Theory the highest Philosopher could exercise his thoughts upon) should be within the reach of the *Jewish* Apprehensions. We do not find in our Learned and Inquisitive Age,
such

such a ready Comprehension and Reception of Truths in Philosophy among the generality of Men ; and 'tis so lately, that an easy Proposition of the Earth's Motions, diurnal and annual, rais'd a mighty Dust, and was very difficultly embrac'd by even those who call'd themselves Philosophers, that from such an instance we may easily imagine how any natural Notions relating to the Constitution and Original of all the Bodies in the Universe must have been entertain'd among the rude and illiterate *Jews*, newly come from the *Egyptian* Bondage, and destitute of the very first Elements of Natural Knowledge. Every one in the History of the Bible may with ease observe, That the Abilities and Studies of the *Israelites* (as indeed 'tis true of most of them to this day) were of another Nature and Size, than must here be suppos'd, if we bring in all the World into the *Mosaick* Creation. If an indifferent Stander by, who had never read the first of *Genesis*, were to judge what a sort of a *νοσημια* were to be given to so Ignorant and Unskilful a Nation ; he could not with common Prudence suppose either that it ought to be perfectly Philosophical, or include any more than the Senses and Capacities of the *Jews* could arrive at, the Earth with its Appurtenances, and the Heavens so far as they were plainly therewith concern'd. Indeed, not only the *Jews*, but the generality of Mankind's Apprehensions always were, and still are much too narrow for any noble Discoveries relating to Universal Nature ; and a Chapter about *Algebra* might almost as suitably to Reason be recommended to them, as an Account of the true Origination of all the World. Nay, *de facto*, it appears, That *Moses* was so far from deeming his People capable of

understanding the intire System of Bodies remote and distant; that 'tis clear, he esteem'd it improper to say a word about the internal Constitution and Parts of our own Earth, contenting himself with what the Surface afforded, and what unavoidably came under the notice of their Senses, as is too plain to be deni'd in the History before us.

And shall we after all this believe or imagine that 'twas fit and proper, nay, or barely possible, for *Moses* to give a full Account of the beginning of all the World? And impress a just, true, and adequate *Idea* thereof on the Minds of the People! I believe 'twas so far from it, that still after all the Accommodation to the Senses and Capacities of Men, which he and the other Holy Writers use on such occasions; yet the meer Observation of the Truth of things forc'd them sometimes to speak what the others were not able rightly to comprehend; and they seem rather, in Natural Truths, to have gone too high, than descended too low, considering the gross Ignorance of their *Readers*, in those Matters.

Those Expressions of Scripture concerning the roundness of the World; the Earth's being founded on the Seas, and established on the Floods; a Compass or Orb being set on the Face of the Deep; the stretching out the Earth above the Waters, and its consisting out of the Water and in the Water; of most of which we shall take notice hereafter. Those Expressions, I say, are exactly accommodate to the real Constitution of the Earth, as will appear in due place; but were, 'tis plain, very much mistaken afterward. Men generally took the Earth to be round, not as a Sphere, but a Circle; and suppos'd the
Abyss

Vid. Phan.
13. infra.

Abyſs, on which 'twas founded to be the Ocean, or Great Sea; on whose Surface, in their Opinion, it swam, and which on every side encompass'd it as far as the very Firmament gave leave, and the ends of the Heaven would permit. That Continent we inhabit, was taken for the whole World, and its Middle or Center, imagin'd by most to be near the place where himself dwelt. The Horizon or Sea, and the Firmament, were believ'd to bound and terminate each other. The Sun, Moon, and Stars, were suppos'd at their descending below the Horizon, to be immers'd in the Sea; and at their ascending above it, to emerge out of it again. How ridiculous these Conceits are, every one will easily judge, who has but a small insight into the System of the World; and how little they are countenanc'd by the Texts before referr'd to, 'twere easy to shew; but 'tis plain, They were so apply'd, and the particulars pretty handsomely adjusted to Mens own Fancies, on these *Hyporbeses*.

When therefore we observe the Expressions of Scripture about the Constitution of our own Earth, to have been so miserably misunderstood and misapply'd, we may easily collect what fate any Notions of a sublimer Nature, concerning the Heavens, and the whole System of Beings, must have undergone amongst them. If the Apostles in a more Learned Age had began their Preaching with the requiring Mens belief to the Motion of the Earth, the being of Antipodes, or any other such *Paradox* in Philosophy, nay, or given them a true and rational Scheme of the Origin of the Universe in all its Parts, we may soon guess at the Reception they would have met with, and at the Success of their Ministry. This procedure

could contribute nothing to their design, neither could the People be made to understand and believe such strange Notions. And as in this case, every one will allow the Absurdity of such a method, and never imagine it probable that the Apostles could make use of it; so ought we, by only changing the Scene, to conclude, *a priori*, that 'tis highly unlikely that *Moses* would take such a course; and that, unless the words of the History were too express and plain to be deny'd, 'tis extremely improbable so great a Lawgiver (to go no farther) would extend his Cosmogony beyond the ends of his Writing it, and the Abilities of those who should read it; or in other words, 'tis extremely improbable that the *Mosaick* Creation is of any other Nature or Extent than the Proposition we are upon does assert.

IX. Lastly, I prove the *Mosaick* Creation extends no farther than this Earth and its Appendages, because the Deluge and Conflagration, whose Boundaries are the same with that of the *Mosaick* Creation extend no farther.

I shall here take it for granted, That the limits here assign'd to the Deluge and Conflagration are just; it being certain as to the former, and I think more than probable as to the latter; and only quote a place, or two to prove the six Days work to be of the very same, and no larger extent than those are, and leave the whole to the Judgment of the Reader. *There shall come in the last days scoffers walking after their own lusts, and saying, Where is the promise of his coming? for since the fathers fell asleep, all things continue as they were from the beginning of the creation. For this they willingly are ignorant of, that by the word of God the heavens*

heavens were of old, and the earth standing out of the water and in the water, whereby the world that then was being overflowed with water, perished: But the heavens and the earth which are now, by the same word are kept in store, reserved unto fire against the day of judgment, and perdition of ungodly men. The day of the Lord will come as a thief in the night, in the which the heavens shall pass away with a great noise, and the elements shall melt with fervent heat; the earth also, and the works that are therein, shall be burnt up. In the day of God the heavens being on fire shall be dissolved, and the elements shall melt with fervent heat. Nevertheless we, according to his promise, look for a new heaven, and a new earth, wherein dwelleth righteousness.

Verse 10.

Verse 12, 13.

Thou, Lord, in the beginning hast laid the foundation of the earth, and the heavens are the works of thine hands: They shall perish, but thou remainest; and they all shall wax old as doth a garment; and as a vesture shalt thou fold them up, and they shall be changed.

Heb. i. 11, 12, 13.

I have now finish'd all those Arguments which to me are fully satisfactory, and I think prove beyond rational contradiction, That not the vast Universe, but the Earth alone, with its dependencies, are the proper subject of the Six Days Creation: And that the *Mosaick History* is not a Nice, Exact and Philosophick account of the several steps and operations of the whole; but such an Historical Relation of each Mutation of the Chaos, each successive day, as the Journal of a Person on the Face of the Earth all that while would naturally have contained. The sum of all is this:

(1.) The very Words and Coherence of *Moses* himself require such a Construction.

G 4

(2.) The

(2.) The Words of Creating, Making or Framing things here us'd, are commonly of no larger importance than this Proposition allows.

(3.) The *World*, or *Heaven and Earth*, the objects of this Creation, are alike frequently restrain'd to the sublunary World, the Air and Earth.

(4.) The Chaos, that known fund and seminary of the Six Days Creation, extended no farther.

(5.) On the contrary supposition, the time of the Creation of each Body is extremely disproportionate to the work it self.

(6.) On the same supposition there is an intolerable disorder, disproportion, and confusion in the works themselves.

(7.) The final cause of the six days Creation is the advantage of Mankind, the Inhabitant of the Earth.

(8.) Neither the intention of the Author, nor the capacity of the Readers require or could bear any other account of the origin of things.

(9.) Lastly, Neither the Deluge nor Conflagration, whose extent appears commensurate to that of this Creation, are of any larger compass than is here assign'd.

Upon this view of the whole matter give me leave to say, That to make the Universal Frame of Nature concern'd in the particular Fates and Revolutions of our Earth, is at this time of day, to demonstrate either very mean thoughts of the Ends of the Divine Workmanship, and of the Effects thereof in the World; or else very proud and extravagant conceits of our own worth

worth and dignity ; and at best argues a narrow, ignoble, and unphilosophical Soul. 'Tis much such another Wife and Rational Notion , as it would be to suppose that the whole Terraqueous Globe , with all its parts and dependencies , all its furniture and productions , was alike concern'd in the *Fates* and *Revolutions* (pardon the expressions) of one single Fly or Worm belonging to it. And we may e'en as fairly allow the intire dependence of this sublunary World on the fortune of such a single *animalculum* ; That on its peeping into the World , the whole Earth must arise out of nothing to afford it a resting place ; while it was growing , and continued in its prime , all things below must spring and flourish , rejoyce and look gay ; on its decay , all things must put on a mournful countenance ; and on its destruction , Universal Nature here beneath must expire together , and return to its primitive nothing. This representation will , I imagine , seem bold and extravagant. But 'twill be hard to prove it so. And I may appeal to Astronomy whether the Earth can be shewn to bear as considerable a proportion to the Universe , as such a poor *animalculum* does certainly bear to it.

I would not by this , or any thing else I have heretofore said in this Discourse , be so far mistaken , as to be believ'd prone to depretiate and and debase Mankind ; or to put a slight on all those Works of Nature and Providence which are subservient to it. Neither do I deny that in some sense all the Visible World , Heaven and Earth , are ordain'd for our use and advantage ; I fully believe that we are the Creatures of God , of whom he has a tender regard , and over
whom

Luke xx.
36.

whom he exercises a constant, a special Care and Providence. As I look upon the Souls of Men, in their proper and primitive perfection, when they came out of their Maker's Hands, to be Noble, to be Glorious, to be Exalted Beings, and perhaps in capacities or faculties, in dignity or happiness, not inferior to some of the Angelick Orders; so I also most undoubtedly believe what our Saviour affirms of good mens state hereafter, that they shall be ἴσῳ ἰσῶν, *equal to the Angels*; and ὁ υἱ τοῦ Θεοῦ *Children of God himself*. While I am perswaded that the Creation of Man was not effected without the concurrence and joint consultation of the Blessed Trinity; Nor his Redemption without the Acceptance of the Father, the Sacrifice and Death of the Son in his Humane Nature; and the Sanctification and Operation of the Holy Spirit. While I am perswaded that the Divine ὁ Θεὸς Πατήρ has ever since the Fall of Adam been solicitous about our Reconciliation to God, and made it his constant business, even before as well as since his Incarnation, to mediate for us, and take care of our eternal happiness. While I believe that by the new Covenant Good Men, even in this Imperfect state, are esteem'd Heirs of God, joint-Heirs with Christ, and denominated the Brethren and Friends of their Glorious Redeemer. While I do not doubt but our Humane Nature is now, in the Person of our Blessed Saviour, in Heaven, and there on account of the Hypostatical Union with the Eternal ὁ Θεός; and as a reward of that Obedience and Suffering, it underwent for us on Earth, advanc'd above the most exalted Intellectual Orders, at the Right Hand of the Majesty

Majesty on High. While I expect the same Person in the Glory of the Father, coming to Judge the World in Righteousness; and Mankind, after that final doom, to be partaker of everlasting Joy or Misery according to their behaviour here on Earth. While, I say, I believe all this, as I most sincerely do, I can be under no temptation of looking with contempt upon, or of entertaining a mean opinion of Mankind, or of those Systems of Nature and Providence relating to it. Yet all this notwithstanding, I think that Opinion I am now exposing, deserves no other Character than I have before given of it.

Tho' I look upon Mankind as one Species of very Noble and Glorious Creatures, yet I suppose it but *One*, and that there may be Millions of others at the least not inferior to him. Tho' I believe Humane Nature, when Innocent and Perfect, at that height of Purity and Felicity which it once had, and by the Christian Dispensation may be again advanc'd to; as so considerable and exalted a Species of Beings; yet withal I look upon it at present as under a very different Character. We are all now in a depriv'd, a sinful, and so in a low, a miserable state. We have by our own wilful Rebellion and Disobedience, made it necessary for God to place us in a short, a vicious, in an uneasie and vexatious World; where at present we are under a sort of confinement in a place of Trial and Probation; and through a doleful Wilderness must make our way to the Land of *Canaan*. *Quisque suos patimur manes*. We here feel the sad effects and punishments of former Sins. We are left to struggle with great difficulties, abide many assaults,

1st Cor. xv.
50.
Joh. xviii.
36.

assaults , and undergo severe Agonies, e're we must expect to recover our native dignity, to retrieve our ancient felicity again, *Exinde per amplum Mittimur Elysium , & reduces læta arva tenemus.* As flesh and blood cannot inherit the kingdom of God , so that Kingdom is not of this World. I see no reason to esteem the present condition of Mortality as at all considerable in it self, (tho' in its consequences it extremely be so) in comparison of the past and future periods of our Beings; and therefore without believing the Earth one of the greatest or noblest Globes in the World , I can suppose it a very proper and suitable habitation for us at present: Most wisely contriv'd, (as it certainly is) and its Furniture peculiarly and wonderfully adapted to our needs , capacities and operations. I acknowledge that Providence has so constituted our Earth that we receive some advantages from all, and very great ones from some other parts of the external and visible World. All which were in the Original Creation of things both foreseen and foredesign'd by God, and so may not improperly be so far said to have been made for our use, and appointed to serve our necessities. I do not think that those Systems of the Universe we here speak of, are ever a whit the less useful to us, or the benefits we reap from them ever the less in themselves , or less worthy of our notice and observation , our admiration and gratitude to God , because they also are subservient to other noble purposes, and are by Divine Providence made use of in several great designs over and above those advantages we are able to take notice of , or can our selves enjoy from them. I cannot imagine that God is peculiarly

culiarly fond of any particular parts of the Material Creation , or any more a *Respecter* of some *inanimate Bodies*, than of *Persons*. He no doubt equally makes use of them all , according to their several kinds and capacities , in the service of the various species of Intelligent Creatures , and in the bringing about the great Periods of Nature , and the Decrees of Heaven ; which as they are in great measure unknown to us , so may they regard Rational Beings very different and remote from us and our concerns.

If we duly reflect on the Infinite Nature , and unlimited Perfections of the Divine Being , the Creator and Original of all things , as well as on the number, vastness, and glory of those his works which are within our view , we shall see reason to confess , there may be millions of Nobler Intellectual Beings interposed between Man and God : And the whole World might be more reasonably suppos'd made at the Creation , and for the sole use of any one species of those , than of Mankind. If therefore we be unwilling to be our selves excluded from a share in the intentions and designs of Heaven , let us not exclude any other rational Creatures from the same ; but be willing to suppose as this Earth was form'd in six days for the sake of Man ; so were the rest of the Heavenly Bodies, form'd at other proper times, for the sake of other of God's Creatures ; for whom Providence ought to be allow'd to have taken a proportionable Care , and made a suitable provision , as we our selves find has been done with regard to us and our affairs. Let us learn humble and modest sentiments of our selves, from the contemplation

Psal. viii.

3, 4

ver. ult.

tion of the immensity of the Works of God in the World. Which useful Lesson the Holy Psalmist would by his own example teach us. With whose Natural and Pious Reflection in this very ease I shall conclude this whole discourse. *When I consider thy Heavens, the work of thy fingers, the Moon and the Stars which thou hast ordained; Lord! what is Man that thou art mindful of him! And the Son of Man that thou visitest him! O Lord our Lord! How excellent is thy name in all the Earth!*

POSTULATA.

POSTULATA.

- I. **T**HE Obvious or Literal Sense of Scripture is the True and Real one, where no evident Reason can be given to the contrary.
- II. That which is clearly accountable in a natural way, is not without reason to be ascrib'd to a Miraculous Power.
- III. What Ancient Tradition asserts of the constitution of Nature, or of the Origin and Primitive States of the World, is to be allow'd for True, where 'tis fully agreeable to Scripture, Reason, and Philosophy.

POSTAL A.

T

11

11

11

11

11

11

11

11

11

11

11

11

11

11

11

11

11

11

11

11

11

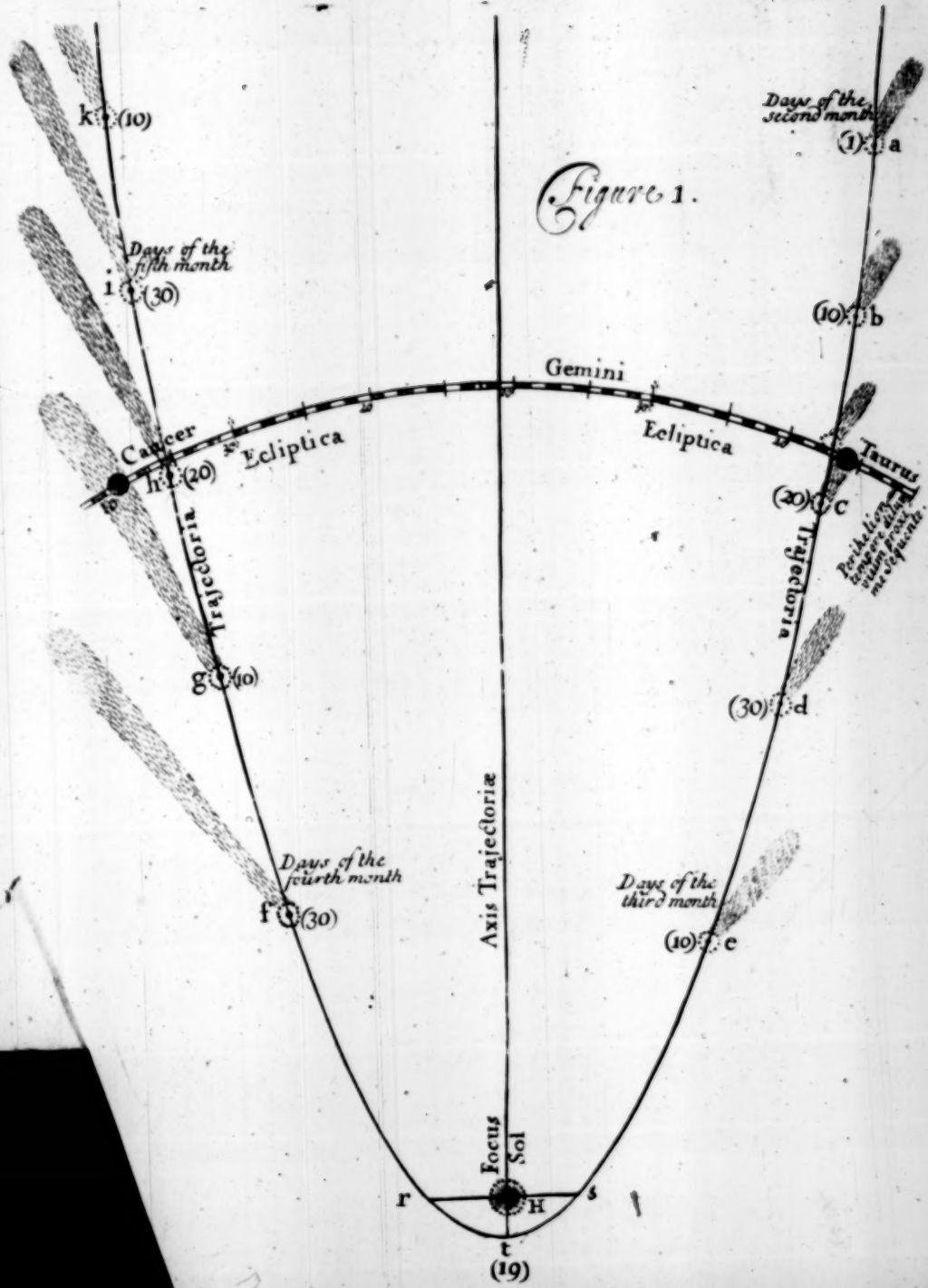
11

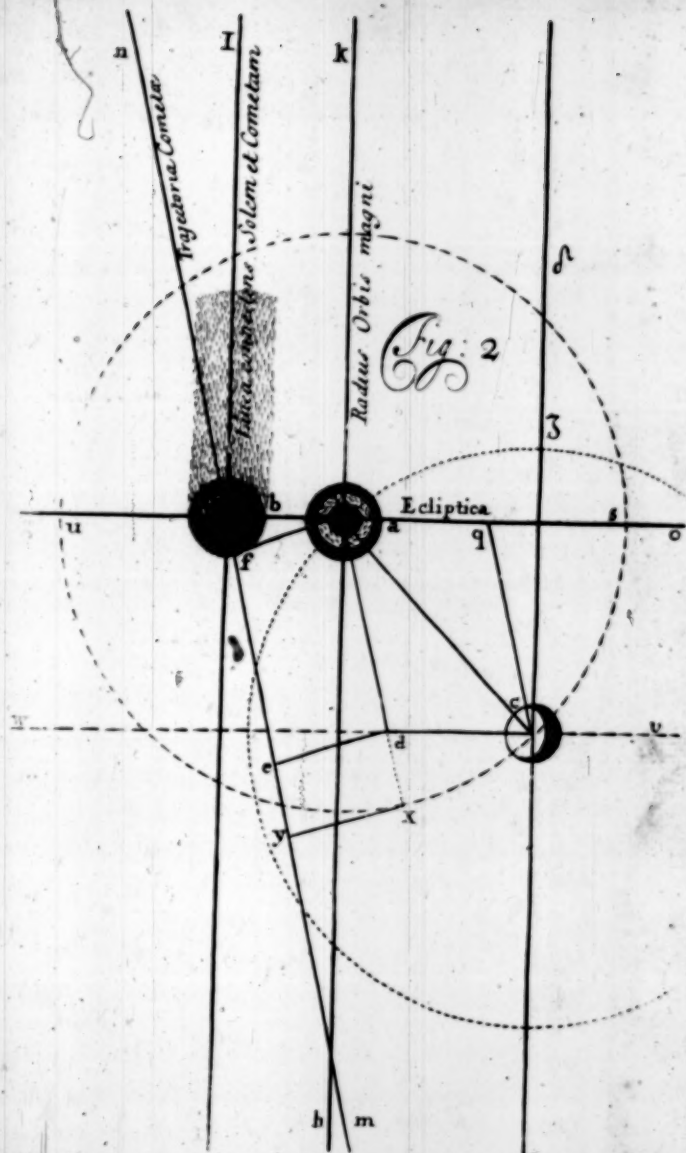
11

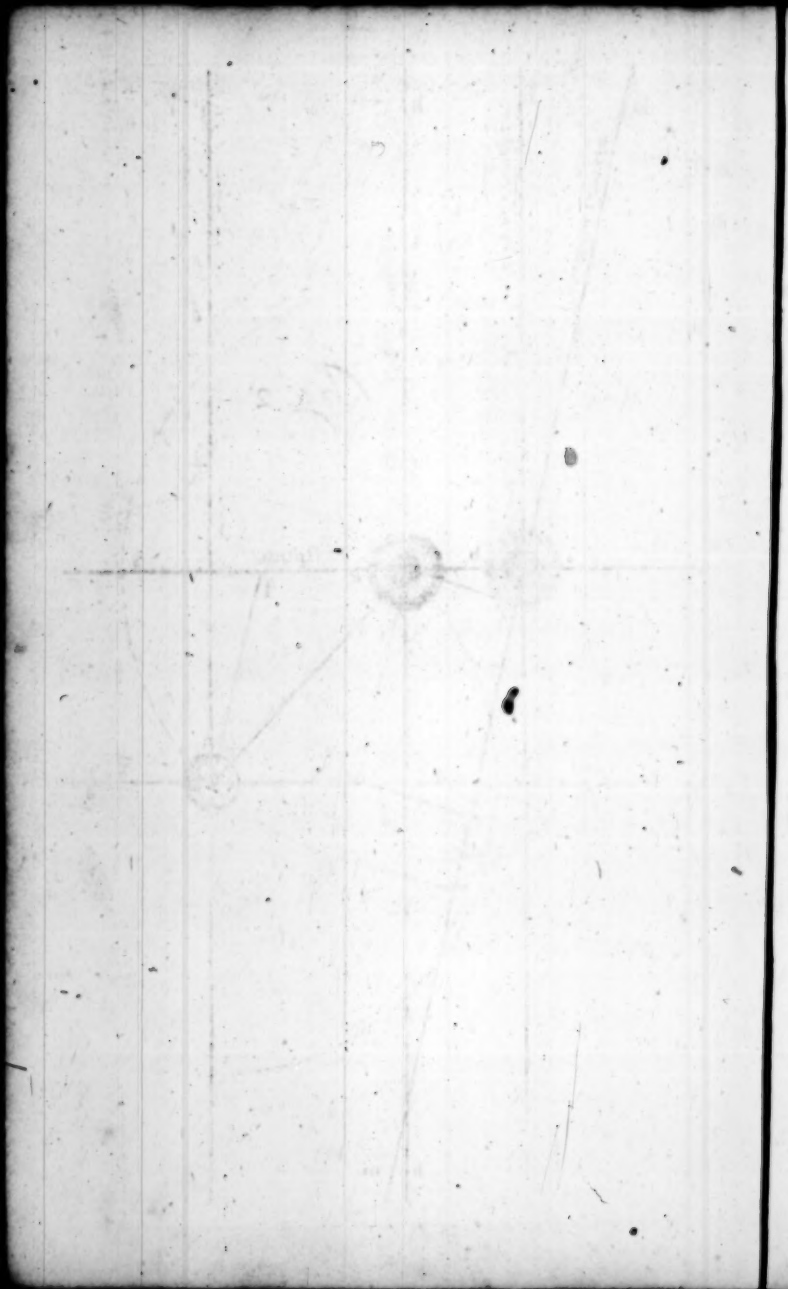
11

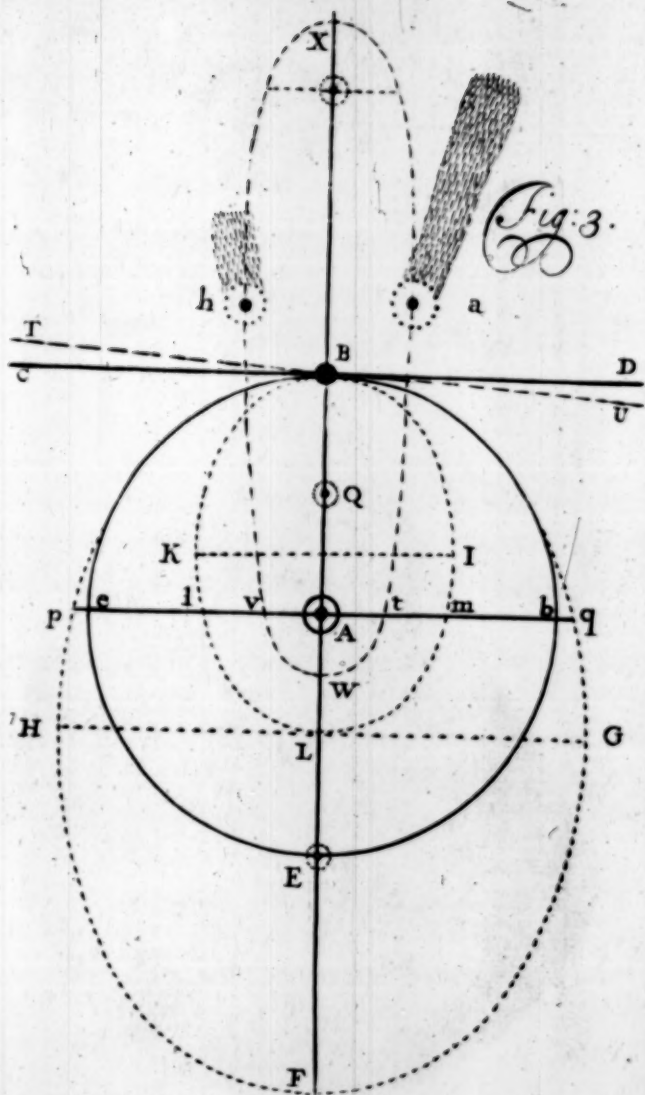
11

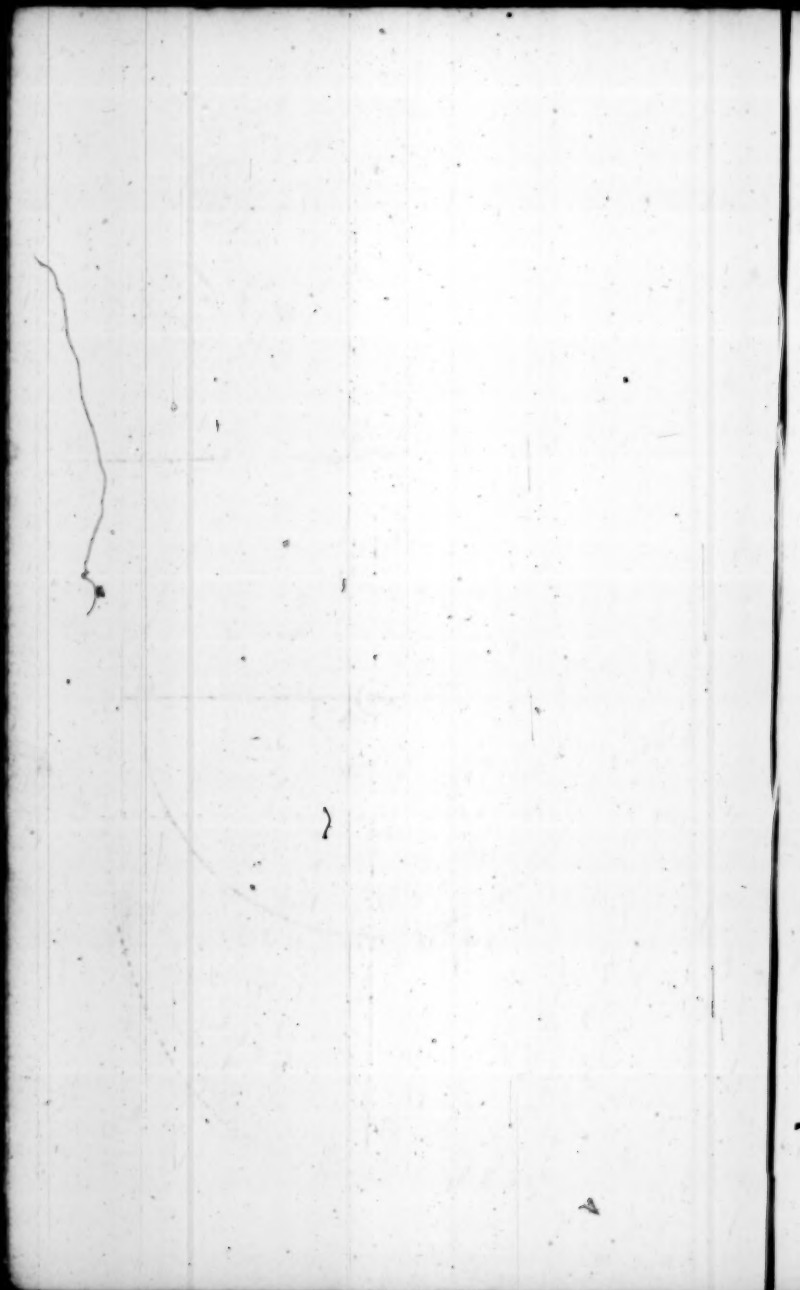
Figure 1.











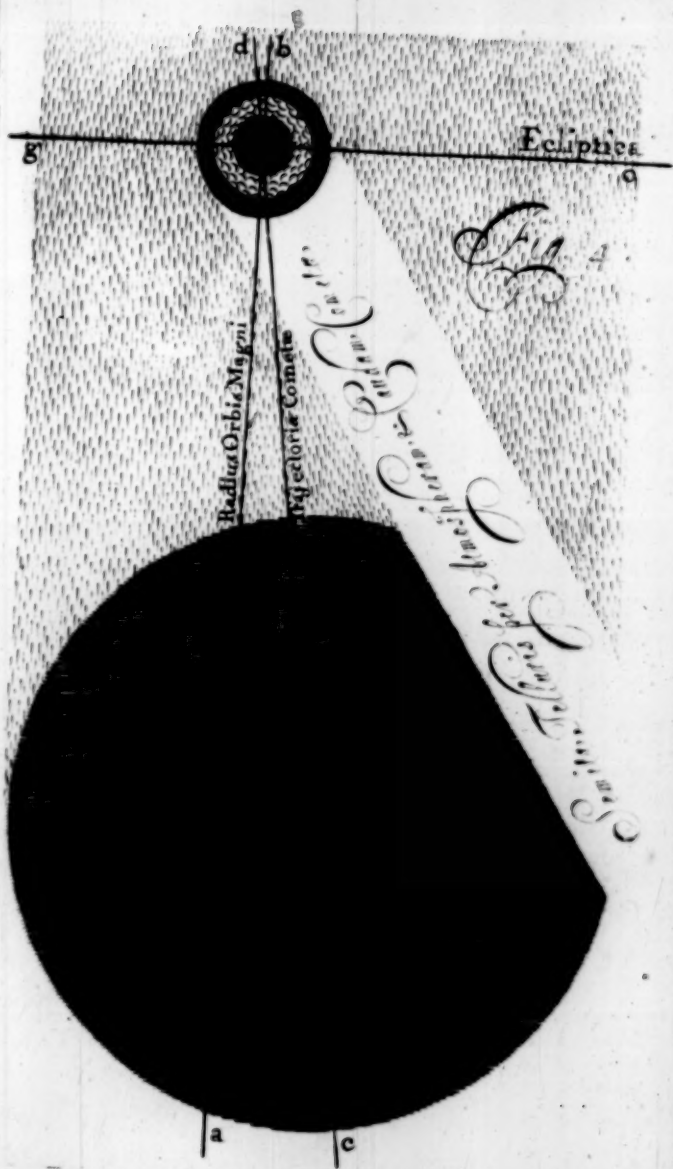
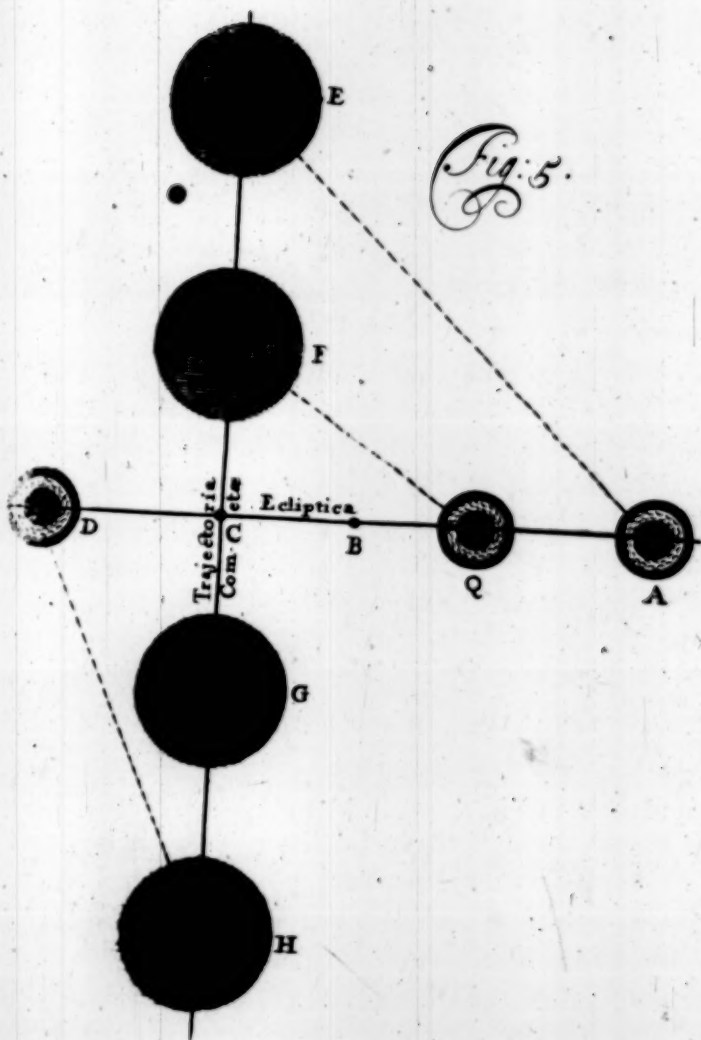
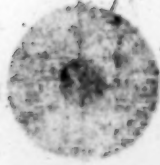
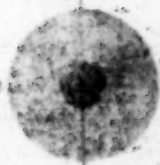
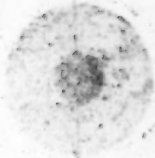
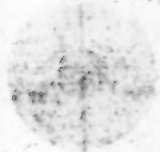




Fig: 5.





12

9

1

3

8

11

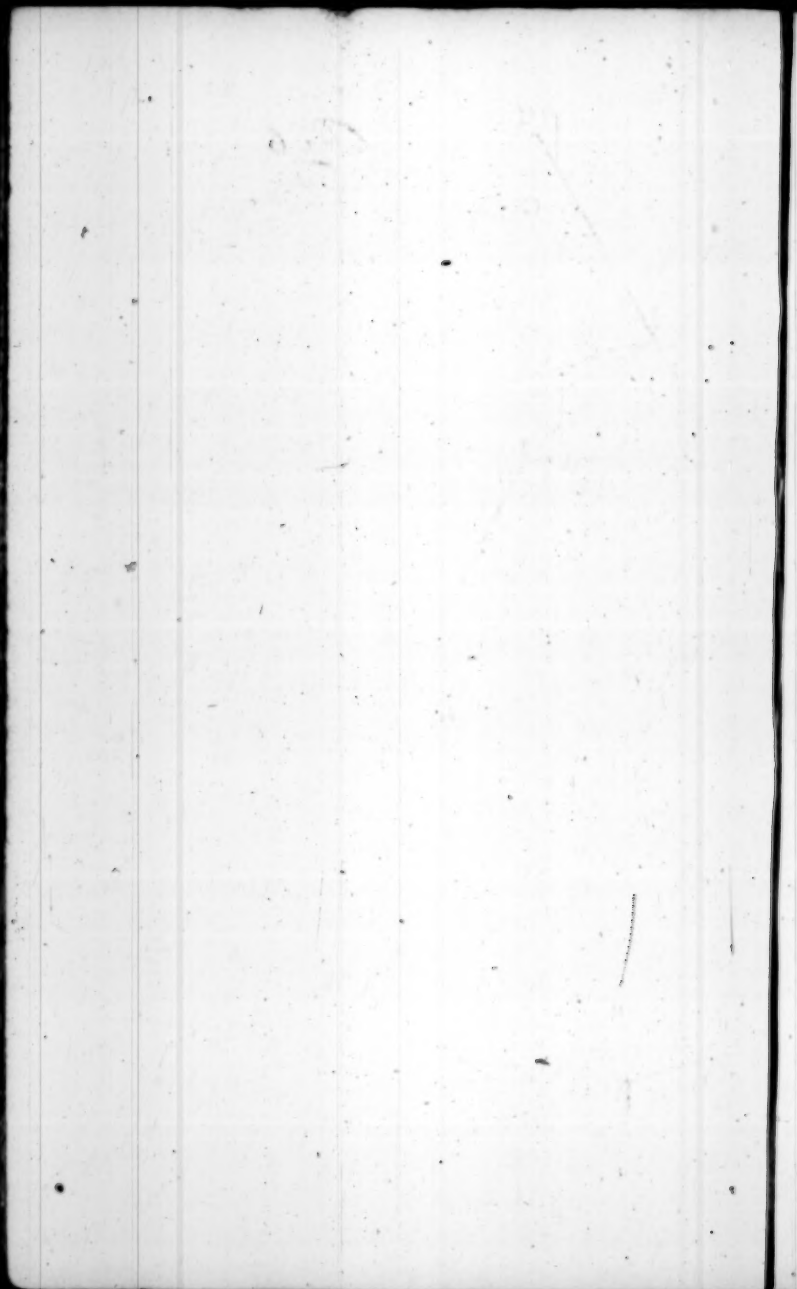
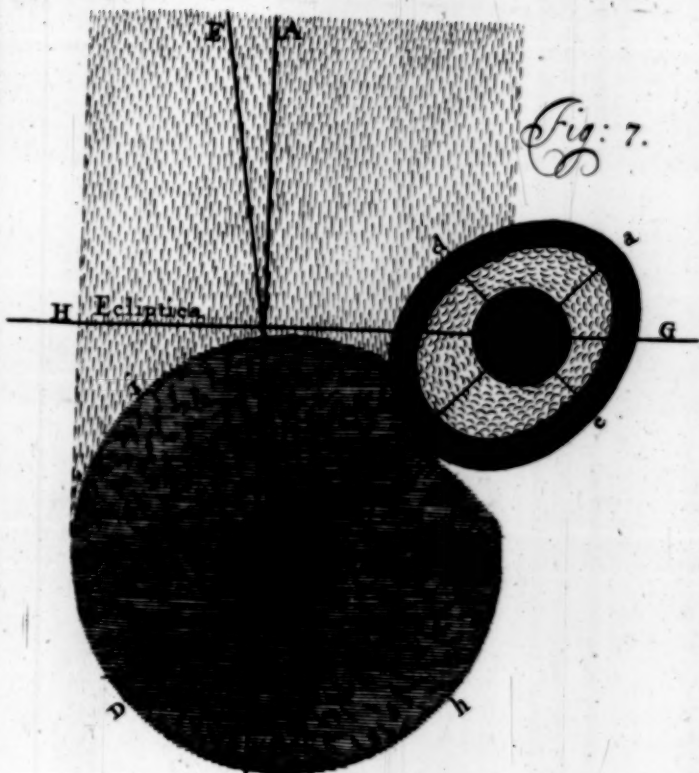


Fig: 7.



Radius Orbis Magni

Trajectoria Cometae



1

A ♡

NEW THEORY
OF THE
EARTH.

BOOK I.

LEMMA.

I. **A**LL Bodies will persevere for ever in that state, whether of Rest or Motion, in which they once are, if no other force or impediment act upon them, or suffer by them.

II. All Motion is of it self rectilinear, and with the same constant uniform Celerity, if no other external Cause disturb it.

Corollary 1. 'Tis evident from these two Propositions, that Matter is intirely a passive Substance.

Coroll. 2. No Spontaneous Motion or Action can be the effect of meer Matter.

Coroll. 3. The Soul of Man, whose least Power seems to be that of Spontaneous Motion, is incorporeal: which is also a necessary consequence of the first Co-

H

rollary

rollary ; for if Matter be perfectly a passive Thing, the Soul, which is so active a Being, cannot be material.

Coroll. 4. *The Bruiſt Creatures giving all poſſible Demonſtrations of Spontaneous Motion, and of a principle of Action; cannot reaſonably be ſuppos'd meerly Corporeal Machines.*

III. All thoſe ſingle Corpuſcles of which Bodies are compos'd, do attract all other ſingle Corpuſcles of which other Bodies are compos'd, and are alike mutually attracted by them. If this Affection of the Parts of Bodies be conſider'd with reſpect to thoſe towards which the Motion is, 'tis call'd *Attraction*, and they are ſaid to *draw* all others. But if it be conſider'd with reſpect to thoſe which are mov'd, 'tis call'd *Gravitation*, or a *Tendency* in them towards others. Thus in Magnetiſm we imagine a Power of Attraction belonging to the Loadſtone; and in the Iron a Tendency, or (as I may call it, tho' ſomewhat improperly) Gravitation towards it. Tho' indeed, by the way, the Force or Affection being found to be mutual and equal on both ſides, the Terms might juſtly be ſo too; and a Loadſtone might as properly be ſaid to tend or gravitate towards the Iron, or Iron to attract the Loadſtone, as the contrary; juſt as 'tis in the Point before us. This however will ſerve for an Illuſtration, and explain our meaning in the preſent caſe, where all the Parts of Bodies are endew'd with ſuch a mutual Gravitation and Attraction with reſpect to all others.

SCHOLIUM.

That no prejudice nor miſunderſtanding may ariſe, 'tis to be obſerv'd, That when we uſe the
terms

terms of Attraction or Gravitation, we do not thereby determine the Physical Cause or Seat of any effects, as if some innate Power or *occult Quality* were to be suppos'd in Bodies (as will appear presently); but only use such familiar Terms whereby our meaning may be easily understood, and the Effects of Nature explain'd, even where the last and proper efficient Cause is not mechanically assignable. Thus we do and may say, as before, That the Loadstone attracts the Iron, or the Iron tends or gravitates to the Loadstone, not ascribing thereby any proper and positive Quality or Power to these Bodies, but for ease of Expression, and for supplying what we cannot otherwise readily explain relating to them. Thus also we commonly say, That Stones are heavy, or tend towards the Center of the Earth; and the Expressions, rightly understood, are true and natural: Tho' perhaps in both cases the real cause of those Effects which we ascribe to such an Attraction, Tendency, or Gravitation, is External, and some continual Impulse from without, not any inherent Power really Existent within, is the Original of all. But in such cases, where the true Agent is invisible or unknown, we must have leave to use those terms which the Matter will bear, or Custom has rendered familiar; without which, uneasy and troublesome Circumlocutions will be unavoidable; especially, seeing that no Error can hereby creep into our Reasonings, because 'tis evident, that all the Effects of Nature are exactly the very same in the World, and not otherwise, which they certainly would and must be if Bodies did really and properly, by their own inherent Virtue or Quality, attract, and were attracted by all others.

IV. This Affection of mutual Attraction or Gravitation is universal in *extent*; all Bodies in the whole World, as far as we have any means of knowing wheresoever they are plac'd, being in common subject thereto, and concern'd therein.

V. This Affection is also universal as to the *kinds* of its Objects; it belonging equally to all the Parts of Matter, of what Sort or Form, in what Figure or Condition soever they are: the difference of Bodies as to Texture and Composition, Fluidity and Firmness, Motion and Rest, Bigness and Subtily, or any other such mutable Qualities, not in the least diminishing the Influence thereof.

VI. This Affection is also universal and equable as to *Time*, without all manner of intermission; without any increase or diminution in different Ages.

VII. The Quantity of the force of Attraction at equal distances is exactly proportionable to the Quantity of Matter in the attracting Body, being in reality nothing but the Result or Summe of the united Forces of all those single Particles of which 'tis compos'd. Thus if A be double to, *i. e.* has twice as much matter as B; A will have a double force of Attraction also, at equal distances from their Centers respectively. If A represent the Earth, B the Moon; if B contain but the twenty sixth part of the matter in A, (as it really does contain no more) and a Globe or Ball were plac'd at the same distance from the Center of B, at which another equal to it were from that of A, it would be but the twenty sixth part so heavy towards B, as the other were towards A.

*Lem. 33.
infra.*

VIII. This

VIII. This mutual tendency of Bodies is greater or less, according as the Bodies themselves are nearer to, or farther from each other. The same Body more forcibly attracting those which are near, than those which are farther off. So that Stone or Pillar which is with us very heavy, would be comparatively very light, if it were as far distant from us as the Moon.

IX. The proportion of the Increase and Decrease of this Gravity of Bodies in their approach to, or recess from each other, is neither that of Similar Lines nor Solids, but of Superficies or Plains: The force of Attraction in several distances being reciprocally in a Duplicate Proportion thereof. Thus when the same Body, without the Surface of the Earth, is twice as near its Center, as it was before, 'tis four times as heavy; when thrice as near, 'tis nine times as heavy; when four times as near, 'tis sixteen times as heavy as before. In like manner, the same strength which were able to sustain a Body of one hundred weight here, would at twice our distance from the Earth's Center, be equally able to sustain four hundred weight; at three times our distance, nine hundred weight; at four times our distance, sixteen hundred weight, and so, *in infinitum*, at all other distances. For as the Squares of the distances increase, so does the Power of Attraction decrease; and as the Squares of the distances decrease, so does the Power of Attraction at the same time increase proportionably; as will be prov'd presently from the known *Phænomena* of Astronomy.

Corollary 1. *From the Comparison of the two first Propositions with the seven last, 'tis evident, That this universal force of mutual Attraction or Gravitation of Bodies is not a result from the Nature of Matter;*

Vid. Bent.
ley, Sermon.
7. p. 26,
¶

Matter; which being circumscrib'd within its own bounds, being incapable of acting at a distance, and besides being intirely passive in its very Essence, cannot possibly draw others, or tend towards them of it self.

Coroll. 2. This universal force of Gravitation being so plainly above, besides, and contrary to the Nature of Matter; on the fermentation'd Accounts must be the Effect of a Divine Power and Efficacy which governs the whole World, and which is absolutely necessary to its Preservation.

Coroll. 3. When the Divine Power is inseparable from the Essence of God, 'tis evident, the latter is Omnipresent as well as the former, and every where equally diffus'd through the Universe; and that therefore in God we properly live, move, and have our being.

Coroll. 4. The Divine Nature is Incorporeal and Spiritual, as being equally present, and equally powerful in the midst of the material World, as in those immense Spaces which every where distinguish the Parts, and surround the Limits of it.

*Coroll. 5. The Providence of God in the Natural World is not meerly a Conservation of its being, or a Non-annihilation thereof; but a constant, uniform, active Influence or Energy in all the Operations done in it; the very same which was exerted in the Original Impression of those Laws of Motion on which it depends. The two first Propositions, 'tis true, seem to require only a Continuation of Existence, without any new or continual Action; but the seven last plainly require more; and no less than I am here pleading for. So that if we should suppose God Almighty to withdraw or suspend this his actual Efficacy and Influence on all the Bodies in the World, tho' he preserv'd their being; the whole would immediately be dissolv'd, and each of the Heavenly Bodies be crum-
bl'd*

bled into Dust; the single Atoms commencing their several Motions in such several straight Lines, according to which the Projectile Motion chanc'd to be at the instant when the Divine Influence (the cause of Gravitation, and all such other Affections of Matter) was suspended or withdrawn.

Coroll. 6. Mechanical Philosophy, which relies chiefly on the Power of Gravity, is, if rightly understood, so far from leading to Atheism, that it solely depends on, supposes, and demonstrates the Being and Providence of God; and its Study by consequence is the most serviceable to Religion of all other.

Coroll. 7. The Epicureans, who endeavour'd to cast the belief of a Providence at least, if not of a Deity out of the World by their Atomical or Mechanical Philosophy, very foolishly misunderstood and abus'd their own Principles; which in reality, when rightly comprehended, do with the greatest Evidence and Conviction establish them both, beyond all other whatsoever.

Coroll. 8. There is no such Ethereal Substance, or Subtile Matter, pervading the Pores of Bodies, which being it self free from the Law of Gravity, or endu'd with a less Proportion thereof, might be imagin'd to be the cause of it in other Bodies, or the means of any other Effects in the World.

Coroll. 9. A Vacuum, or Space distinct from Matter, is necessary to be admitted. For were the World equally full every where, when all Matter is equally heavy in proportion to its Quantity, there could not possibly be any difference in the Specifick Gravity of Bodies; it being on the Hypothesis of a Plenum impossible that a Cube of Gold should be heavier than an equal Cube of Air, and its contained subtile Matter together; and by consequence equally impossible that the former should over-balance or descend in the latter, which yet all experience shews it really does. So that

a Plenum is so far from accounting for the Phenomenon of Gravity, as some would have it, that it utterly subverts the possibility of it; and while the last is evident, the first must needs be indefensible.

Fig. 3.

X. From the Uniform Projectile Motion of Bodies in straight lines, and the Universal Power of Attraction or Gravitation, the curvilinear motion of all the Heavenly Bodies does arise. If a Body, as B, be moving uniformly along the line DC, from D to C; and another Body A be present, this latter Body A must draw the former B from its straight line DC, and by doing so continually, while at the same time the Body B retains its Projectile force along a straight line in every point of its Course, must make the line of its real motion a bent one, and change its rectilinear into a curvilinear trajectory.

Coroll. Hence we may learn what is that conatus recedendi à centro motus in revolving Bodies, and in what sense 'tis to be understood. For when, as we have already seen, all Bodies have a vis centripeta, or propension towards one another; 'tis impossible they should of themselves, in as proper a manner, have a contrary propension, or vis centrifuga; an endeavour of avoiding one another, (if these improper terms will be allow'd me.) The true meaning therefore of this attempt or endeavour to get farther off the Center of Motion is only this, That all Bodies being purely Passive, and so incapable of altering their uniform motion along those straight lines, or tangents to their curves, in which they are every moment, still tend onwards in the same lines, and retain their propension or effort towards that rectilinear motion all the time they are obliged to move in curves; and consequently at every point of their course, endeavour to fly

fly off by their Tangents. Now the parts of the Tangent to which this endeavour is, being farther from the Center than those of the Curves to which the bodies are actually forc'd, an attempt to go on in the Tangent may be, and is stil'd an attempt to go farther off or recede from that Center; tho' from no other affection than that of inactivity, or of persevering in a rectilinear motion. So that tho' the vis centripeta, or power of gravitation be an active and positive force, continually renew'd and impress'd on Bodies; the vis centrifuga, or conatus recedendi à centro motus is not so, but the mere consequent and result from their inactivity. This is evident in Bodies revolving in Ellipses about one of the Foci, in their descent towards it; where the Tangent being oblique to the Radius, or Line, from the Point of Contact to the Focus, this very conatus recedendi à centro motus, by urging it along the Tangent, will for some time make it approach nearer to the Focus; (tho' not so much nearer as by its revolving in the Ellipsis it self) as may be seen in the Scheme, if a Body at B. were moving towards L. about the Focus H. Schem. 1.
 And this explication is confirm'd by all experience. For Fig. 6.
 let a Stone be let loose from the Sling, or any revolving body be disengag'd from the force which retain'd it in its Curve, and it will not go from the Center, but only pass along the Tangent in which it was moving as if there were no such Center near it at all.

XI. A Rectilinear or Projectile motion of the Planets along the Tangents to their Orbits, (which when once begun, always uniformly continues) join'd or compounded with their gravitation to the Sun, in the common Center or rather Focus of our System, is the Original of all the Planetary Revolutions about him.

Thus

Fig. 3.

Thus if *Jupiter*, for instance, represented by B, were moving uniformly along the Line DC, from D towards C; if the Sun A were absent, the Planet would pass on straight from B to C, with the same velocity with which it had come from D to B. But if upon its arrival at the point B, the Sun in the Center or *Focus* A begin to affect it, the Planet, by the Sun's Attraction, must be drawn from a rectilinear to a curvilinear course; and be oblig'd, if the Sun's Power be great enough compar'd with the Planets velocity, to revolve about him, and that, the attractive force always continuing, for ever after. The case is just the same as if B were a Stone in a Sling, A the Hand of the Slinger, (by the help of the strings united together, and represented by the line AB) whirling it round continually. For as the Stone at its coming to the point B, were it let loose and left to it self, would fly off in the straight Line or Tangent BC, yet by force is still retain'd at an equal distance from the hand of the slinger, and compell'd to revolve in a kind of circle; so 'tis here. The Attraction of the Sun in the common Center or *Focus* compels all the Planets, which of themselves would pass along their several Tangents, to revolve about it self, and describe their several curvilinear Orbits. And the case is the same in the secondary Planets with respect to their primary ones, about which they revolve in the same manner as they all both Primary and Secondary revolve about the Sun, in the common Center or *Focus* of the intire System.

Coroll. I. Hence 'tis manifest, that the Law of universal Attraction once established, unless the Divine Power had put the Planets into a suitable motion in right lines, they must soon have been drawn downwards,

wards, and fall'n into the Sun: And still, if their motions should be intirely stop'd and cease, the same must happen, and they must not only be incapable of those noble uses to which they are now subservient, but utterly perish in the violence of the Sun's scorching heat. The preventing of which therefore ought justly to be attributed to the Wisdom and Power of God in the constitution of the World.

Coroll. 2. If the World be limited and finite in its extent, 'tis so in its time also; and so vice versâ if eternal in its time, 'tis infinite also in its extent. For when all Matter (as far as we have any means of knowing, and so in reason all Matter whatsoever) is endu'd alike with a power of attraction; and must all thereby, without proper motions along straight lines, at last meet in the common Center of Gravity of the whole; and when withal the other Systems of fixt Stars, suppos'd here finite, retain their site and distance from each other, and thence appear not to have any projectile motion along straight lines to prevent the same; had the frame of the World been eternal, the effect abovemention'd must have innumerable ages ago, really come to pass; and all the matter of the intire Universe compos'd one single dull and unmoveable heap or mass in the common Center of Gravity of the whole: Which not having happen'd, demonstrates the impossibility of the Eternity of the World, and the necessity of admitting its production in time by the Power of God. When therefore 'tis unreasonable to suppose the material World truly unlimited in extent, 'tis necessary to suppose it no more unlimited in duration also. And this reasoning is unavoidable, unless we allow the most invulnerable and constant property of Matter in our System to be peculiar to it, and so to be a voluntary Constitution of God Almighty; or at least that a miraculous Providence does hinder the foremention'd Effect continually.

Serm. 7.
P. 37, 38.

tinually. So that upon the whole, as the very Learned Mr. Bentley has observ'd, either the Divine Power in Creating, or peculiar Providence in Governing the frame of Nature, is on these undoubted Principles for ever establish'd.

XII. When the Projectile Motion of the Planets is in its Direction, Perpendicular to a Line from the Sun, and in its degree of velocity, so nicely adapted and temper'd to the quantity of the Sun's Attraction there, that neither can overcome the other, (the force of gravitation towards the Sun, and the celerity of the Planets proper motions being perfectly *in equilibrio*) the Orbits of such revolving Planets will be compleat Circles, themselves neither approaching to, nor receding from the Sun the Center of their motions. And the Case is the same in the Secondary Planets about their Primary ones. Thus 'tis supposable, that the Velocity of all the Planets about the Sun, was exactly accommodate Originally to his Power of Attraction, and that their Primitive Orbits were perfect Circles; from which at this day they do not mightily differ. Thus however *Jupiter's* four Satellits or little Moons have their Motions so exactly proportion'd to their gravitation to him, that their Orbits, as far as the most nice Observations can judge, are perfect Circles, they keeping at an equal distance from his Center in all the points of their courses about him.

XIII. When the Projectile Motion is not adapted to, but is either too swift or too slow for the Attraction towards the Central Body, the Orbits describ'd will be *Ellipses*; and in the former case, when the Projectile Motion is too swift, the Orbit will be bigger than the Circle before-

before-mentioned; and the nearer *Focus* of the *Ellipsis* will be coincident with the Central Body; And in the latter case the Orbit will be less than the Circle, and the farther *Focus* of the *Ellipsis* will be coincident with that Central Body. Thus if the celerity of B, be exactly correspondent to the attractive force of the Central Body A, neither will prevail, and the Body, preserving an equal distance from the Center, will describe the Circle B e E b. If the Celerity be greater, it will overcome the Attraction, and cast it self farther off the Center for some time, and so revolve about it in the larger *Ellipsis* BHFG; the Central Body, possessing that *Focus* A, which is nearest the point B, where the Attraction began. But if the Celerity be smaller, the Attraction of the Central Body A, will be too hard for it, will force it for some time to come nearer, and to describe the lesser *Ellipsis* E K L I; the Central Body possessing that *Focus* A which is farthest from the point B, where the Attraction began: As will be very plain from the consideration of the Figure relating hereto.

Fig. 3.

SCHOLIUM.

'Tis indeed possible that the Celerity of Bodies may be so great, compar'd with the force of Attraction to the Central Body, as to cast them off with such violence, that the Attraction will never be able to bring them round, or make them revolve about it: In which case the Orbits describ'd will be one of the other Conick Sections, either *Parabola's* or *Hyperbola's*; according to the less or greater violence with which the Bodies are thrown; and the Central Body will possess the *Focus* of such a Figure. But no *Phænomena* of Nature persuading us that *de facto* any of the
Heavenly

Heavenly Bodies do describe either of those Lines, (tho' Comets *Ellipses* come near to *Parabola's*; of which hereafter) I shall not farther insist upon them here. For if what has been said of *Ellipses* has been well understood, the rest can have no great difficulty in it.

XIV. Several Bodies moving about the same Central one, tho' their Primitive Velocity were equal, and direction alike, yet if they be at different distances from it, they will describe figures of different Species about it. For when that determinate degree of Velocity, which at one distance were just commensurate to the Central Bodies Attraction, and so would produce a circular Orbit, must at a farther distance be too hard for it, by reason of the diminution of the Attraction there; an *Elliptical* Orbit must be describ'd; whose nearer *Focus* would be coincident with the Central Body. In like manner, when the same determinate degree of Velocity were at a nearer distance, where the Central Attraction is augmented, it would be too little for the same; and an *Elliptical* Orbit must be describ'd, whose farther *Focus* would be coincident with the Central Body. This cannot be difficult if what has been hitherto said have been rightly apprehended. For when the *species* of the Planetary Orbits depend solely on the proportion between the Attraction towards the Central Body, and the Velocity of the Projectile Motion; as that proportion remaining at any distance whatsoever, the bigness of the Orbits will be various, but the *Species* the same; so when that proportion is chang'd, the *Species* of the Figures must be chang'd also: Which being done, the Velocity given, by the various force of Attraction in several

veral distances from the Center, as well as by the various Velocity, at a given distance, of which before; 'tis evident the *Species* of the Orbits will be different in this, as well as in the former Case.

Coroll. *The greater disproportion there is between the quantity of Attraction, and the Velocity of the revolving Bodies, in the circumstances mention'd in the two last Propositions, the farther from a Circular, and the more Oblong and Eccentric will the Orbits describ'd be. And the greater approach to correspondence there is, the nearer to circular, and the less Oblong and Eccentric will the same Orbits be.*

XV. The circular Orbits of Planets depend not only on the exact adjustment of the Projectile Velocity to the attractive Power of the Sun, but upon the direction of the same Projectile Motion, at the original Commencing of the Attraction. Thus where the Planet is in its own Tangent neither Ascending nor Descending, and the Angle preceding C B A is a right one, which we have hitherto suppos'd; from the correspondence of the Velocity to the Attraction, the Orbits will be perfect Circles. Otherwise, when the direction of the motion is oblique, in any measure ascending from, or descending to the Central Body, and the preceding Angle C B A obtuse or acute, the Planet, tho' its Velocity were exactly adapted to the Attraction of the Central Body, would revolve in an *Ellipsis*; and the point B, where the Attraction began, would be the end of the lesser *Axis* thereof. All which will become easier by what we shall presently come to explain of that figure.

Fig. 3.

Coroll. *From these four last Propositions, compar'd with the present System of the Planetary World, 'tis*
obvious

*Fid. Bent.
17, Serm. 8.*

obvious to take notice of the Wise and Careful Providence of God, and his most accurate contrivance in the disposal and regulation of the whole: Whereby the primary Velocity of the Planets, their several distances from the Central Bodies, and the original direction of their motions, have been each so nicely adjusted and adapted to the force of Attraction every where, that all the Orbits of the Planets became thereby either truly circular, or not very much different from the same. Which remark will appear the more just, and considerable, if we reflect on the infinitely different degrees of Velocity, and oblique direction; with the immensely various distances from the Central Bodies, equally possible with those which were so fully pitch'd upon; and observe, to what noble and valuable uses these Bodies are now subservient, which, without the foremention'd exactness of contrivance in each particular, could not have been provided for. All which demonstrate the great necessity of interesting the Divine Providence; and the worthiness of its so careful interposition in such cases.

SCHOLIUM.

In order to the easier apprehension of the Motions of the Celestial Bodies, and of those things already said, or to be said hereafter, relating to them, 'twill not be improper in this place to give some account of the Generation, Nature, and Easie Properties of *Ellipses*; in which, (including the Circle, as is commonly done) all the Heavenly Bodies (as far as we have hitherto reason to believe) revolve perpetually; so far at least as will be directly subservient to our present purpose, and give any Light to the following Theory. Take therefore, from the great *Des Cartes*, this natural and obvious description or delineation of
an

*Cartes.
Dioptr.
Cap. 8. &c.*

an *Oval* or *Ellipsis*; which tho' familiar to the Gardener and Joyner, is a very good one, and gives as just and compleat an *Idea* of it as any other whatsoever.

Take a small Cord or Packthread, which is very pliable, and yet not easily stretch'd beyond its natural length; Tye the two ends together, by which means it will be a sort of round or circular circumference mutable into all Figures. Let two Pins or Nails, H and I, be driven into a plain Board or Table; put the Cord or Packthread round the two Pins or Nails H and I, and with a Pencil or any such thing, (which, as it is drawn along, will make a small stroke) in your hand, turn it round about the two Pins or Nails, as about a double Center, till you return to the Point from whence you began. Thus if B be the Point where you begin the delineation, continue it either way, by O F M K N E P D, or D P E N K M F O, till you return to B again. By which means the Point of your Pencil will describe such a Curve as is here represented, and is call'd an *Ellipsis*. The nature and properties whereof, as far as at present we shall consider the same, are as follow.

Fig. 6.

Fig. 6.

Schem. 1.

(1.) The Species of the *Ellipsis* depends on the proportion there is between the length of the Cord, and the distance of the two Centers H and I: And consequently, wherever that determinate proportion is given, the Species is given also, tho' the bigness and capacity be chang'd: But where that proportion is not given; as, the length of the Cord remaining, where the distance of the Centers is chang'd; or, that distance remaining, the length of the Cord is chang'd; or both are chang'd, but not in the same proportion; in all these cases the Species of the *Ellipsis* is different.

I

Thus

Thus in particular where the distance of the Centers, or the Line HI , is greater in proportion to the length of the Cord, there the *Ellipsis* is farther from, and where 'tis less the *Ellipsis* is nearer to a Circle. All which is so obvious on a very little consideration of the Delineation, and Figure, as 'tis represented in the two different Schemes, that no more words need be us'd about it.

(2.) If in a considerably large Figure the two Points H and I be very near together, it will be scarce distinguishable from a Circle; and in any Figure if they be suppos'd to unite, and be coincident, the Eccentric Curve will become Concentric; and the *Ellipsis* degenerate into a Circle; as perfect a one, as any drawn with a pair of Compasses. Whence we see why a Circle is reckon'd among the *Ellipses*; and how it may be generated by a way very like that made use of in their delineation.

(3.) As when the Points H and I are coincident, the *Ellipsis* loses its Eccentricity, and denomination, and commences a Circle; so, on the other hand, if the distance HI be indefinitely lengthened, while the difference between that distance and the length of the Cord, (equal to DH and IK or double to one DH ; as the Pencil at D is easily perceiv'd) remains the same, the *Ellipsis* will go through all Species, and at last become indefinitely Oblong and Eccentric, and one half of it, as FDE , will degenerate into the very same Figure we call a *Parabola*. For as all degrees of Eccentricity make *Ellipses* of all Species; so no degree of Eccentricity makes a Circle; and an indefinite or infinite degree of it makes a *Parabola*: Which, tho' we have no necessity to consider it so distinctly in this place (none of the Heavenly Bodies, as far as we yet know, describ-

ing

ing truly such a Line, as has been already observ'd;) yet on account of the Comets Orbits, which are nearly *Parabolical*, at least deserv'd our notice; and the first Figure will shew an example of it. Fig. 1.

(4.) An *Ellipsis* being describ'd about two Points, as a Circle about one, or those two united; hence may appear in some measure the nature of these Points. They are indeed called the *Foci* or *Umbilici* of the Figure, but might not unfitly be nam'd the *Centers* thereof. And how naturally each of them bears much the same respect to the *Elliptick* Periphery, that the *Center* does to the circular one, is partly obvious from the foregoing delineation; and of which those who are acquainted with the *Conick Sections* cannot be ignorant. To whom the matter will be still plainer, if they consider the generation of an *Ellipsis* from the Section of a *Conick* superficies, by a plain intersecting the opposite sides of the *Cone*, and yet not parallel to the *Basis*; as the Geometricians usually do. For there the *Axis* of the *Cone*, or Line which passes from its *Vertex* through the Center of the Circle its *Basis*, does not pass through the middle or Center of the *Ellipsis*; but one of those Points we are speaking of. And accordingly, if the name *Center* had not by custom in the *Ellipsis* been borrowed from the Circle on account of its position, rather than some other properties of it, and thence appli'd to the middle point in the *Ellipsis*; it might very fitly, as has been before said, have been given to the two Points H and I, now stil'd the *Foci* or *Umbilici* thereof. And by the same reason the corresponding single Points, going under the same names in the *Parabola* and *Hyperbola*, would deserve and challenge the same denomination. And this is so agreeable to the true System of the Planetary World, that in the new

Astronomy (and thence in these Papers) the stile is sometimes continued; and 'tis not unusual, I may add, nor very improper, to say, That the Sun, the common *Focus* or *Umbilicus* of all the Celestial *Elliptick* Orbits, is in the *Center* of our System, or possesses the *Center* of the Planetary World.

(5.) Tho' all the Lines passing through the Center in a Circle, being equal, are equally considerable; yet 'tis otherwise in the *Conick Sections*; where that Line through the *Focus* alone which cuts the principal *Axis* at right Angles, is remarkable above all the rest; and in very many cases peculiarly considerable. This Line is stil'd the *Latus Rectum*, and in the *Ellipsis* is, after the longer and shorter *Axis*, the third proportional. Thus in the Figure before us, as *DK* is to *EF*, so is the same *EF* to *OP* or *MN*, the *Latus Rectum* thereof, so famous with the Writers on the *Conick Sections*.

(6.) The subtense of the Angle of Contact *bd*, parallel to the distance from the *Focus* *BH*, at an equal distance from the Point of contact *B*, if that distance be suppos'd infinitely small, is in all parts of the same *Ellipsis*, or other *Conick Section* equal to it self. The Truth and Use of which property is not yet sufficiently known.

(7.) If from any Point in the circumference of an *Ellipsis* as *B*, Lines be drawn to each *Focus*, *BH*, *BI*; these two Lines taken together are always equal to themselves, and to the longer *Axis* *KD*: As the delineation of the Figure does plainly manifest.

(8.) If the Angle made by the Lines to the *Foci* from any certain Point, *HBI* be divided in the midst by the Line *BA*; the said Line *BA* will be perpendicular to the Tangent, or Curve at

at the Point of contact; and so the Angles ABL ABG will be right ones, and equal to each other, as consequently will equal parts of them LBH : IBG .

(9.) A Line drawn from either *Focus* to the end of the lesser *Axis*, HE or IE , is equal to half the longer *Axis* CD or CK : as is evident by the last particular but one. And the same Line is Arithmetically the middle proportional between the greatest and least distance from the said *Focus*. Thus HE , for instance, is just so much longer than HD , as 'tis shorter than HK ; the difference in both cases being the Eccentricity HC or CI .

(10.) The Tangent of an *Ellipsis* LG is never perpendicular to a Line drawn from the *Focus*, excepting the two points which terminate the longer *Axis* D and K . And if you imagine the point of contact B , with the Radius BH , and the Tangent LG , to move round the *Ellipsis* together, from B towards D ; the preceding Angle, HBL , will, in the descent from K by F to D , be an acute one; (its acuteness increasing from K to F , and as much decreasing from F to D) and in the ascent from D by E to K an obtuse one; (its obtuseness increasing from D to E ; and as much decreasing from E to K ;) in both semi-revolutions arriving at rightness at the Points D and K , the ends of the longer *Axis* alone; as was here to be observ'd.

Fig. 6.
Scheme 1.

(11.) The *Area* of an *Ellipsis* is to that of a circumscrib'd Circle, (whose Diameter is equal to the others longer *Axis*) as the shorter *Axis* of the *Ellipsis* is to the same longer *Axis* or Diameter.

(12.) If the Circumferences of a Circle, and of an *Ellipsis*, be equal; the *Area* of the Circle is the greater. It being known, that of all Figures,

gures, whose *Perimeters* are equal, the Circle is the most capacious.

(13.) If an *Ellipsis*, by becoming infinitely Eccentric, degenerate into a *Parabola*; the *Latus Rectum* will be four times as long as the nearest distance to the *Focus* thereof. Thus r s is four times as long as $H t$.

Fig. 1.

XVI. All Bodies which, together with a Projectile or Uniform Motion along right Lines, are continually attracted or impell'd towards one certain Point or Center, let the attraction or impulse be of what nature or quantity soever, will always (no other Force interposing) by a Line drawn from that Center to themselves, describe equal *Area's* in equal times, and so proportionable *Area's* in proportionable times, through all parts of their courses. Thus if the *Area* describ'd the first minute were equal to a thousand square Feet; whether the Bodies came nearer or went farther off, it would always in a minute be equal to the same thousand square feet; in two minutes double, or two thousand; in three minutes treble, or three thousand; in four minutes Quadruple, or four thousand; and so for ever proportionably. The demonstration of this noble and exceeding useful *Theorem* is both easie and pleasant: But that not being my present business, I shall, as in the rest, refer the Reader to the Great Author himself for satisfaction.

XVII. All Bodies, *vice versa*, which revolve in Curves; and by a Line drawn from themselves to a certain Point or Center, describe *Area's* proportionable to the times of description; are attracted or impell'd continually towards that Point or Center.

Corollary.

Corollary. *When therefore Lines drawn from every one of the Planets to the Sun, describe perpetually Area's proportionable to the times of description; as is own'd by all Astronomers; 'tis certain that, besides their several Projectile Motions, they are every one continually attracted or impell'd towards the Sun; and from such compounded forces revolve about him. And the case being the same in the Moon about the Earth; the Circumjovials about Jupiter; and the Circumsaturnals about Saturn; this Corollary equally belongs to them also.*

XVIII. If Bodies from a Projectile Motion, and an attraction or impulse to a Point or Center move about the same in a *Spiral Line*, which intersects every Radius in the same Angle; the force of the attraction or impulse, at different distances from that Center is reciprocally as the Cubes of such distances: And *vice versa*, if the force of attraction or impulse to any Center be as the Cubes of the distances reciprocally; Bodies revolving about the same must describe *Spiral Lines*, intersecting the Radij in the same Angle.

XIX. If Bodies from a Projectile Motion and an attraction or impulse to a Point, move about it, being the Center of an *Ellipsis*, in the Periphery of the same *Ellipsis*; the force of attraction is *directly* as the distance from such a Center: And *vice versa*, if the force of attraction or impulse to any Point be as the distance from the same *directly*, Bodies revolving about it must describe an *Elliptick Figure*; with whose Center the fore-mention'd Point will be coincident.

XX. If Bodies from a Projectile Motion, and an attraction or impulse to a Point, describe an *Ellipsis* about that Point, coincident with one of

its Foci; the force of Attraction towards that Focus is reciprocally as the squares of the distances from the same. And *vice versa*, if the force or attraction to any Point be in a duplicate proportion of the distances from the same reciprocally; Bodies revolving about the same must describe Ellipses about it, coincident with one of the Foci thereof.

Corollary 1. Where Bodies revolve about any Point or Central Body, from the Figure describ'd, and the Situation of the Point or Central Body, the Law of attraction or impulse tending towards the same is discovered. And *vice versa*, where the Law of attraction or impulse is known, the Figure to be describ'd by revolving Bodies, and the Situation of the Point or Central Body, towards which the attraction or impulse is, with respect to such Figures, is *a priori* discover'd also.

Coroll. 2. None of the Heavenly Bodies describing either Spiral Lines, or Ellipses about their Centers, 'tis certain no Law of Gravitation in a triplicate reciprocal, or direct simple proportion of the distance from the Central Body, obtains in the Planetary World.

* Coroll.
Lem. 17.
prius.

Coroll. 3. * All the Planets revolutions arising from the composition of their Projectile Motion and Gravitation towards the Sun; and they all describing Ellipses about him, in the Common Focus of all their Orbits, as is evident from Astronomy; 'tis hence certain that the force of their attraction or impulse towards the Sun is in a duplicate proportion of their distances reciprocally.

Coroll. 4. The case being the same as to the Moon about the Earth, and the Circumsaturnals about Saturn; this last Corollary belongs equally to them also. But Jupiters Satellits revolving in compleat Circles are incapable of affording evidence in his case.

XXI. If several Bodies revolve about the same central attractive Body at several distances; and the periodical Times in which they revolve be to each other, as the Squares of their distances from the same; the force of Attraction or Impulse to that central Body is in a triplicate Proportion of such distances *reciprocally*; and *vice versâ*, if the force of Attraction or Impulse be as the Cubes of their distances *reciprocally*, the periodical Times of Revolution will be to each other, as the Squares of their distances from the same central Body.

XXII. If several Bodies revolve about the same central attractive Body, at several distances in *Circular* or *Elliptick* Orbits, and the periodical Times of revolving be all equal; the force of Attraction or Impulse towards the central Body is *directly*, as the distances from the same.

XXIII. If several Bodies revolve about the same central Body, in *Circular* or *Elliptick* Orbits, at several distances; and the Squares of the periodical Times of revolving are to each other as the Cubes of the middle distances from the same central Body; the force of Attraction or Impulse towards the same is in a duplicate Proportion of the distances from the same *reciprocally*.

Corollary 1. Where several Bodies, from a *projectile Motion*, compounded with a *Gravitation* towards a central Body, revolve about the same at several distances; from the Proportion there is between the periodical Times of revolving, compar'd with the distances from the central Body, the Law of Gravitation tending towards the same is discovered; and *vice versâ*, where the Law of Gravitation is known, the Proportion between the periodical Times compar'd with the distances from the central Body is, *a priori*, discover'd also.

Coroll. 2.

Coroll. 2. *None of the Heavenly Bodies periodical Times of revolving being to each other as the Squares of their distances from the central Body, nor equal to one another; 'tis certain, as before, that no Law of Gravitation in a triplicate reciprocal, or direct simple Proportion of the distances from the central Body, obtains in the Planetary World.*

* Coroll.
Lem. 17.
prints.

Coroll. 3. ** All the Planets Revolutions arising from the Composition of their projectile Motion and Gravitation towards the Sun, and the Squares of their periodical Times of revolving being to each other as the Cubes of their middle distances from him; 'tis hence certain, That, as before, the force of their Attraction or Impulse towards the Sun, is in a duplicate Proportion of their distances reciprocally.*

Coroll. 4. *The Case being the same as to the Circumjovials about Jupiter, and the Circumsaturnals about Saturn; this last Corollary belongs equally to them also. But the Moon being a single Planet revolving about the Earth, is incapable of giving evidence in her Case.*

Coroll. 5. *As before, the Law of Gravitation being demonstrated from the Planets revolving in Ellipses about the central Bodies in one of the Foci; the Proportion between the periodical Times, compar'd with the distances from the central Bodies, was deducible à priori; so vice versâ, the periodical Times compar'd with the distances demonstrating the Law of Gravitation, thence the necessity of the Planets Revolution in Ellipses, about the central Bodies in one of the Foci, is à priori demonstrated also.*

Coroll. 6. *'Tis certain, That the Annual Motion belongs to the Earth about the Sun, not to the Sun about the Earth. For when from the Moon's Orbit, and the Planet's Orbits and periodical Times, 'tis certain, That the Law of Gravitation towards the Earth, and towards the Sun is the same; and by consequence,*
all

all the periodical Times of Bodies revolving about each of them in the same Proportion to one another, compar'd with their several Distances from each of them: On Which Hypothesis, this Proportion suits the Phenomena of Nature, the same must be the true one, and to be fully acquiesc'd in. Now 'tis known, That on the Hypothesis of the Earth's Annual Motion, her periodical Time exactly suits, and is so between that of Venus and Mars, as the Proportion observ'd through the whole System, and demonstrable à priori, withal, exactly requires; but on the other Hypothesis 'tis enormously different. For when the Moon undoubtedly, and on this Hypothesis the Sun also, revolves about our Earth; and when the distance of the Sun is to that of the Moon as about 10000 to 46; and the Moon's periodical Time less than 28 days; the periodical Time of the Sun is by the Rule of Three discoverable thus: As the Cube of the Moon's distance, 46 equal to 97336; to the Cube of the Sun's 10000 equal to 1000000000000. (or almost as 1 to 100000000) so must the Square of the Moon's periodical Time 28 Days equal to 784. be to the Square of the Sun's periodical Time, 78400000000; whose square Root, 88204, are Days also, equal to 242 Years. So that on the Hypothesis of the Sun's Revolution about the Earth, its periodical Time must undoubtedly be 242 Years, which all Experience attests to be but a single one. So that at length the Controversy between the Ptolemaick and Pythagorean Systems of the World is to a Demonstration determin'd, and the Earth's Annual Motion for ever unquestionably establish'd.

Coroll. 7. 'Tis certain those Opaque Masses which sometimes appear at the Sun, are not Planets revolving at any the least distance from him, but Spots or Maculae adhering to him: for whereas they revolve but once in about twenty six Days; on Calculation it will appear, that a Planet near the Sun's Surface as these must

must be, cannot have three hours allow'd for its periodical Revolution, which being so different from the foremention'd space of twenty six days, quite decides that Controversy, and demonstrates those Masses to be real Maculæ adbering to the Body of the Sun, as is here asserted.

XXIV. If a Planet describe an *Ellipsis* about its central Body in the *Focus* thereof, it will move fastest when 'tis nearest to, and slowest when 'tis farthest from the said central Body or *Focus*; and agreeably in the intermediate places. For seeing wheresoever the revolving Body is, the *Area* is still proportionable to the time, as was before shew'd; and so in equal times always equal; 'tis evident by how much the Distance is less, and the Line from the *Focus* is shorter; by so much must the Bodies motion be the swifter to compensate the same: and *vice versâ*, by how much the former is longer, by so much must the latter be slower to allow for it.

Fig. 6.

XXV. If the Planet B describe an *Ellipsis* about the central Body in the *Focus* H; as the *Area* describ'd by the Line B H, will be exactly uniform and proportional to the time of Description; so the *Angular Motion*, or Velocity of the Line from the other *Focus* B I, will be proportional to the time, and uniform also; tho' not so Exactly and Geometrically.

Fig. 6.

XXVI. The Law of Gravitation already explain'd being suppos'd; if one Planet describe an *Ellipsis* about the central Body in the *Focus* H, and another describe a Circle about the same in its Center: If the Semidiameter of the Circle be equal to H E, the middle distance in the *Ellipsis* from the same Center or *Focus*, their periodical Times of revolving will be the same; and

and when the Distances are equal, their Velocity will be so too.

Corollary, *Tho' therefore the Planets revolve in Ellipses of several Species, yet their periodical Times may be as well compar'd with one another, and with their distances from the central Bodies, as if they all revolv'd in compleat Circles; as was above done.*

XXVII. If a Body revolve about a central Body, as about A in a Circle, as B e E b; and another revolve about the same in the Focus of its Ellipsis B H F G, so that the Semidiameter of the Circle were equal to the nearest distance in the Ellipsis, A B; the Velocity of the Body at the nearest Point of the Ellipsis will be greater than the Velocity of the Body in the Circle; and will be to it in half the Proportion of the *Latus rectum* of the Ellipsis p q, to the Diameter of the Circle e b; or as that Line p q, to a middle proportional between it self and e b.

Fig. 3.

XXVIII. If one Body revolve round a central Body in a Circle, and another about the same in its Focus describe so very Eccentric an Ellipsis that it may pass for a Parabola; the Velocity of the Body moving along the Ellipsis, will be to that of the Body moving in the Circle (the Point in the Ellipsis being as far from the central Body as the Circumference of the Circle) very nearly as ten to seven.

XXIX. If a central Body have many Bodies revolving about it; 'tis perfectly indifferent in it self, and with regard to the central Body, in what Plains soever, or which way in those Plains soever, they all or any of them move.

Corollary. *Hence arises a convincing Argument of the Interposition of Council and Providence in the Constitution of our System; in which all the Planets revolve the*

Serm. 8.
p. 13.

the same way, from West to East; and that in Plains almost coincident with one another, and with that of the Ecliptick, as Mr. Bentley hath also observ'd.

XXX. The Order of the Heavenly Bodies in the Solar System is as follows: *First* of all, The vast and glorious Body of the Sun is plac'd in the middle, very near the Center of Gravity of the intire System, in the common *Focus* of every one of the Planetary Orbits. Next to him *Mercury* describes his *Ellipsis*, and that so near, that we on Earth rarely obtain a distinct view of him. Next to *Mercury* is the *Elliptick* Orbit of *Venus*, our glorious Morning and Evening Star. Next to *Venus* our Earth, with its attendant the *Moon*, perform a joint Course, and Measure out the Annual Period. Next to the *Earth* the fiery Star *Mars* alone, without any visible Guard accompanying him, revolves about the same Center. Next to *Mars*, tho' at a mighty distance from him, the largest of the Planets, *Jupiter*, with his four remarkable *Satellites*; and lastly *Saturn* with his five little *Moons* about him, describe the farthest and most remote Orbits, and compleat the intire Planetary *Chorus*, as the Frontispiece of the Book represents them to the Contemplation of the Reader.

SCHOLIUM.

Besides the Planets, whose Orbits are not very different from Circles, there are another Species of Bodies revolving about the *Sun* in such *Ellipses*, as may pass for *Parabolas*, they are so exceeding Eccentric; but as regularly retaining their several Periods and Orbits, as the Planets
now

now mention'd. But because these Bodies will be more distinctly consider'd hereafter, I shall wave their farther Consideration at present, and proceed.

XXXI. The periodical Times of each Planet's Revolution about the *Sun*, are as follow.

		Y.	D.	H.
<i>Mercury</i>	} revolves about the <i>Sun</i> in the space of	00	— 088	— 00
<i>Venus</i>		00	— 224	— 18
<i>The Earth</i>		00	— 365	— 06
<i>Mars</i>		01	— 315	— 00
<i>Jupiter</i>		12	— 000	— 00
<i>Saturn</i>		30	— 000	— 00

XXXII. The middle distances of the Planets from the *Sun*, are as follow.

<i>Mercury</i>	} is distant from the <i>Sun</i>	020952000	} Statute Miles, each 5000 <i>Paris</i> Feet.
<i>Venus</i>		039096000	
<i>The Earth</i>		054000000	
<i>Mars</i>		082242000	
<i>Jupiter</i>		280582000	
<i>Saturn</i>		513540000	

SCHOLIUM.

The Proportions of these Numbers are unquestionable: But the Numbers themselves only within about a fourth part under or over. The Reason of such uncertainty is, That the *Sun's Parallax* or Angle which the Diameter of the Earth would subtend to an eye at the *Sun*, on which the whole depends, is not yet accurately determined by Astronomers; so that between 24 and 40 Seconds, no number can be certainly pitch'd

pitch'd upon, till farther Observations put an end to our Doubts. On which Account I have endeavour'd to come as near to Probability as possible, and have suppos'd the Sun's *Parallax* 32'' in a middle between the two foremention'd Extreams; and from this *Hypothesis* made these and the following Calculations; which therefore cannot well be above a fourth part under or over the truth, but very probably are much nearer it.

XXXIII. The quantity of Matter in such of the Heavenly Bodies as afford us means of determining the same, is in the Proportions following.

<i>The Sun's</i>	_____	66690.
<i>Jupiter's</i>	_____	00060 $\frac{1}{2}$.
<i>Saturn's</i>	_____	00028 $\frac{1}{2}$.
<i>The Earth's</i>	_____	00001.
<i>The Moon's</i>	_____	00000 $\frac{1}{36}$.

SCHOLIUM.

Because the Solidity or Quantity of Matter in Bodies is in a triplicate Proportion of their Diameters; that small uncertainty in the Sun's *Parallax* beforemention'd, imports a great deal in the present Calculation. I shall therefore give the Reader the Proportions of the Quantity of Matter in the Heavenly Bodies on the two extream *Hypotheses*, as well as I have done on the middle one; only informing him, that the *Hypothesis* of 24'' seems nearer the truth than the opposite extream of 40'', as being nearest the accurate Observations of our great Astronomer Mr. *Flamsteed*. The quantities of Matter therefore, are as follow,

The

<i>The Sun's</i> —28700	} If the Sun's Paral- lax be 40 ¹¹ .	<i>The Sun's</i> —136560	} If the Sun's Paral- lax be 24 ¹¹ .
<i>Jupiter's</i> —00026 ¹¹ / ₁₁		<i>Jupiter's</i> —000124 ¹¹ / ₁₁	
<i>Saturn's</i> —00012 ¹¹ / ₈		<i>Saturn's</i> —000057 ¹¹ / ₁₃	
<i>The Earth's</i> —000001		<i>The Earth's</i> —0000001	
<i>The Moon's</i> —00000 ¹¹ / ₃₆		<i>The Moon's</i> —000000 ¹¹ / ₃₆	

Corollary. *The weight of Bodies at equal distances from the Sun and Planets, being in the same Proportion with the Quantity of their Matter, as has been Lem. 7. already said; the same Numbers assign'd in the last prints. Lemma, which explain the latter, serve equally to explain the former also.*

XXXIV. *The Diameters of the Sun and Planets, are as follows.*

<i>The Sun's</i> ————	4941007	} Statute Miles, each 5000 Paris Feet.
<i>Saturn's</i> ————	043925	
<i>Jupiter's</i> ————	052522	
<i>Mar's</i> ————	002816	
<i>The Earth's</i> ————	008202	
<i>The Moon's</i> ————	002223	
<i>Venus's</i> ————	004941	}
<i>Mercury's</i> ————	002717	

XXXV. *The weight of Bodies on the Surface of the Sun, and those Planets mention'd in the 33^d Lemma before, is as follows. On the Surface of*

<i>The Sun</i> ————	10000.
<i>The Earth</i> ————	01258 ¹¹ / ₁₁ .
<i>Jupiter</i> ————	00804 ¹¹ / ₁₁ .
<i>The Moon</i> ————	00630.
<i>Saturn</i> ————	00536.

K

XXXVI. *The*

XXXVI. The Densities of the same, (whatever be the *Sun's Parallax*) is as follows.

<i>The Moon's</i>	—————	700.
<i>The Earth's</i>	—————	387.
<i>The Sun's</i>	—————	100.
<i>Jupiter's</i>	—————	076.
<i>Saturn's</i>	—————	060.

XXXVII. As the weight of Bodies without the Superficies of the Heavenly Bodies increases in a duplicate Proportion of their nearness to their Centers; so within the same Superficies, does it decrease in a simple Proportion thereof; and is consequently greatest upon the Superficies themselves. Thus a Body at 10000 Miles distance from the Earth's Center, is four times so heavy as it would be at 20000. But within the Earth, if a Body were twice as near its Center as 'tis on the Surface, it would be but half so heavy as 'tis here; if thrice as near, it would be but a third part so heavy; if four times as near, it would be but a quarter so heavy; and so for ever proportionably. Gravity therefore is most considerable on the Surface, decreasing both ways, upward in a duplicate Proportion of the *reciprocal* Distance; and downward in a simple *direct* Proportion thereof.

XXXVIII. If the central Regions of a Globe contain a spherical Cavity within the same; Bodies plac'd therein, from the equality of Attraction on every side, will not tend any way, or gravitate at all, but be as perfectly at liberty, as if they were not affected by any such Law of Attraction or Gravitation.

XXXIX. The *Moon* revolves about the Earth from *West* to *East* in 27 Days, 7 Hours, 43 Minutes;

nutes; and in the very same space of Time, by a strange Correspondence and Harmony of the two Motions, revolves the same way about its own *Axis*; whereby (one Motion as much converting it to, as the other turns it from the Earth) the same side is always expos'd to our sight.

XL. The Librations of the *Moon's* Body, which cause not exactly the same Hemisphere thereof to be perpetually expos'd to our sight, arise from the Eccentricity of the *Moon's* Orbit, from the Perturbations by the *Sun's* Attraction, and from the Obliquity of the *Axis* of the Diurnal Rotation to the *Moon's* own Orbit, without the knowledge of which Circumstances her *Phænomena* were inexplicable, but by the consideration of them are very demonstrable.

XLI. In the 2365th year of the *Julian* Period, the Autumnal Equinox was on the 11th day of *October*. 'Tis evident from the Astronomical Tables of the Anticipation of the Equinox, that in 4044 years (the time since the beforemention'd Year) the Equinoxes have anticipated 30 Days 9 Hours. 'Tis also evident, That this Year 1696. the Vernal Equinox is on the 9th of *March*, and the Autumnal on the 12th of *September*; 'tis farther evident, That whereas now the Space from the Vernal to the Autumnal Equinox is eight or nine Days longer than from the Autumnal to the Vernal, by reason of the Position of the *Peribolion* of the Earth's Orbit near the *Winter* Solstice; at the time beforemention'd it was not above five or six Days so. By the Anticipation therefore of the Equinoxes alone, if the Position of the *Peribolion* had been always the same, the Equinoxes at the time assigned had been on the 9th of *April* in the Morning,

ing, and on the 12th of *October* in the Evening; and the equaller Division of the Year allow'd for, the Vernal Equinox was on the 10th of *April*, and the Autumnal on the 11th of *October*, as was to be prov'd.

XLII. Comets are a Species of Planets, or Bodies revolving about the *Sun* in *Elliptical* Orbits, whose periodical Times and Motions are as constant, certain, and regular as those of the Planets; tho' till very lately wholly unknown to the World.

XLIII. These *Elliptical* Orbits of Comets are so very Oblong and Eccentric, that while they come within our Observation, they are but little different from *Parabola's*, and may accordingly be consider'd as such.

XLIV. The Plains in which various Comets move, are themselves exceeding various, and at all imaginable Angles of Inclination with one another, and with that of the *Ecliptick*.

XLV. The course of Comets in their Orbits is not determin'd one way, (as is that of the Planets from *West* to *East*) but indifferently some of them move one way, and some another.

Corollary 1. From these two last Lemmata, 'tis evident, that Comets move sometimes from *East* to *West*, other times from *West* to *East*; sometimes from *North* to *South*, other times from *South* to *North*; or obliquely between any of these ways, according as the Situation of the Plains of their Orbits, and the Directions of their Courses together determine them.

Coroll. 2. Hence 'tis certain, That the heavenly Motions are not perform'd in corporeal Vortices; when the Comets exactly observe the same Laws and Velocity of Motion, whether they revolve with or against, or cross to the Planets, and the suppos'd fluid Matter of the Vortices.

XLVI. Comets

XLVI. Comets in their descent to, and ascent from the *Sun*, pass quite through the Planetary System; as may be seen in the Frontispiece.

Corollary. Hence we may observe a new possible Cause of vast Changes in the Planetary World, by the access and approach of these vast and hitherto little known Bodies to any of the Planets.

XLVII. If a Comet in its descent to, or ascent from the *Sun*, approach near to a Planet as it passes by, and its Plain be different from that in which the Planets move; by its attractive Power it will, agreeably to the universal Law of Gravitation of Bodies, draw it from the Plain in which it before mov'd, and so cause it afterward to move in a new one, inclin'd to the former, but passing through the *Sun*, as the former did.

Corollary. Hence 'tis supposable, That tho' the Planets originally revolv'd in the same common Plain, yet by the subsequent Attraction of Comets, their Plains may now be inclin'd to one another, and different; as 'tis certain de facto they now are.

SCHOLIUM.

When the Law of Gravitation is universal and mutual, 'tis evident, The Planet would draw the Comet from its Plain, as well as the Comet would draw the Planet; and so generally, what effects soever the Comets could have on the Planets, the latter would have correspondent ones on the former. But as this Indication once given for all, there is no necessity of taking notice of the changes in the Comets; so accordingly, in what follows, I shall wholly omit the same; and confine my self to such things as will be immediately useful in the following Theory.

Fig. 3.

XLVIII. If a Comet revolving in the same Plain with a Planet, whose Orbit is a perfect Circle, as it passes by, approach near it, by accelerating or retarding the Velocity of the Planet, it would render its Orbit *Elliptical*. Thus if B were a Planet revolving about the Sun at the Center A, in the circular Orbit B e E b; and a Comet either in its descent towards, or ascent from the Sun should pass near it, it would agreeably to the universal Law of Gravitation of Bodies, accelerate it, if concurring with, or retarding it, if contradicting the Planet's own annual Motion along the Periphery of its Circle. Whereupon the concentric Orbit would become excentric, and the Planet would afterward revolve in an *Ellipsis*, which on an Acceleration would be bigger, and on a Retardation less than the Circle which it had till then describ'd; the former represented by B H F G, the latter by B K L I. For when the original Velocity of B was exactly adjusted to the Sun's Power of Attraction, and its Orbit thereupon a perfect Circle, this new Acceleration or Retardation must render it afterward incommensurate, and too great, or too little for the same; and accordingly the Orbit to be afterward agreeably to what has been formerly explain'd, describ'd by the Planet, must be an *Ellipsis*; and bigger or less than the former Circle, as the force was directed for, or against, the Planet's own Motion.

Lem. 11,
12, 13.
prior.

Corollary 1. In this Case the Sun would no longer be in the Center of the Figure, but in one of the Foci, viz. in the nearer Focus of the larger, and the farther of the smaller Ellipsis.

Coroll. 2. If B were the Earth moving circularly about the Sun from West to East, i. e. from B by e, E b

E b to B again; and a Comet h in its descent towards the Sun should pass by before it, or on the Eastside; the annual Motion of the Earth would be accelerated, and its circular Orbit degenerate into the larger Ellipsis B H F G, about the Sun in its nearer Focus A.

XLIX. If a Comet in passing by as before, accelerate the Planets Motion, and so enlarge the Orbit, the Planets periodical Time of revolving will be enlarg'd, and become longer thereby. In like manner, if the Comet retard the Planets Motion, and so diminish the Orbit, the periodical Time of revolving will be lessen'd, and become shorter. And still the more considerable the Acceleration or Retardation is, compar'd with the original Velocity of the Planet, the greater will be the eccentricity, and the greater difference between the former and latter Orbits, and the former and latter periodical Times of revolving also.

Corollary 1. If in the foregoing Case the Semidiameter of the ancient Circle, with the middle Distance in the Ellipsis afterward describ'd be given, as also the periodical Time of revolving in the latter, the periodical Time of revolving in the former is at the same time determin'd. For as the Cube of the middle Distance in the Ellipsis, to the Cube of the Semidiameter of the Circle, so is the Square of the periodical Time in the Ellipsis, to the Square of the periodical Time in the Circle. So that three of those terms being known, which is here suppos'd; the fourth, by the Golden Rule, is known also, whose square Root answers the demand of this Corollary.

Coroll. 2. When therefore the three Postulata's now mention'd are given in the case of the Earth, (supposing that it anciently revolv'd in a circular Orbit) as

will hereafter appear; the time of its annual Revolution in that original and circular Orbit may easily be at this day discover'd.

Fig. 3.

L. If a Planet moving in a circular Orbit were accelerated by an Attraction directly along its Tangent or Periphery; the preceding Angle made by the Tangent and Radius CBA would still remain a right one, and the point B, where the Acceleration happen'd, would afterward be the nearest to the *Focus*, or the *Perihelion* in the *Ellipsis* afterward to be describ'd. So if it were alike directly retarded along its Tangent or Periphery, the Angle would still be a right one; and the Point B where the Retardation happen'd, would be the farthest from the *Focus*, or the *Aphelion* in the *Ellipsis* to be afterward describ'd.

LI. If therefore such Acceleration or Retardation were caus'd by a Body moving uniformly along its Trajectory on each side of the Planets circular Periphery, the oblique Acceleration above, would take off the nearly equal oblique Retardation below, or the contrary; and thereby the effect afterward remaining would be all one, as if the prevailing force, whether of Acceleration or Retardation were only along the Tangent or Periphery; all one, as if the whole Attraction were caus'd while the attracting Body was at or near that Tangent or Periphery it self; and by consequence the Point B would be, as above, the *Perihelion* or *Aphelion* of the *Ellipsis* afterward describ'd.

LII. But by reason that Bodies revolving about the *Sun*, move still swifter when nearer, and slower when farther off; the Motion of a Comet is swifter within than without the Periphery of the
the

the fore-mention'd Circle. If therefore (to omit here and hereafter cases not to our purpose) a Comet in its descent towards its *Perihelion* pass just before the Body of a Planet, and Accelerate it; because the time of Acceleration without the Periphery of the Circle is longer than the time of the retardation within it, the effects of the outward oblique Attraction must be somewhat more than of the inward; and the preceding Angle become somewhat obtuse. Thus if a Comet in its descent from X by h to W Accelerate the Planet B; Fig. 3. by reason of the prevalence of the outward oblique Attraction, the Planet will be not only Accelerated, but drawn outward in some measure also, and the preceding Angle, which before was constantly a right one, and represented by C B A will be a little obtuse, and be represented by T B A; and by consequence the Point B will be a few degrees past the succeeding Perihelion, just so many as in the said *Ellipsis* are necessary to render the Angle made by the Radius, or Line from the *Focus*, and the Tangent, obtuse in the same proportion with that above-mention'd. So that on such an Acceleration the *Perihelion* will be some degrees more backward than the Point B, at which the Acceleration happen'd.

Coroll. If therefore in a given year, a Comet, in its descent towards the Sun, Accelerated the Earth's Annual Motion, and chang'd its Orbit from a Circle to an *Ellipsis*; the degree of the *Ecliptick*, and day of the year, when the same Attraction happen'd, may be pretty nearly determined by the place of the *Perihelion* at the same time, from the *Astronomical Tables* of its Place and Motion.

Fig. 5.

LIII. If the nearest distance of a Comet to a Planet be given, the time of Attraction to be consider'd is from thence determinable. Thus if a Comet in its Descent towards the Sun, as from E to H, pass'd by a Planet moving in the Circumference of its circular Orbit from A to D, and so accelerated the same: Let CG be the Line describ'd by the Comet while the Planet passes along from B to C, at which last Point C the Comet is suppos'd to have been at its nearest distance, when the Planet is at B; and let CF be equal to CG. In this case the Acceleration by the Comet between E and F, being nearly taken off by the retardation between G and H; (and the like is to be suppos'd of the Acceleration beyond E, and the retardation beyond H, not to be contain'd in the Figure) 'tis evident that all the Attraction which is to be consider'd, is that Accelerating the Planet while the Comet passes from F to G, and the Planet from Q to C: As the sole view and consideration of the Figure it self will give sufficient evidence. Which from the Velocity of the motion of Comets and Planets easily calculated, might be soon determined; if the nearest distance CB were once ascertain'd.

Coroll. 1. If therefore the nearest distance CB were known, and the bigness or quantity of Matter in the Comet it self; seeing the time of Acceleration is withal known; the quantity of Acceleration, the increas'd Velocity of the Planet; and by consequence the Magnitude of the Elliptick Orbit to be afterwards describ'd; and the periodical time of revolving answerably thereto, might all be à priori determined.

Coroll. 2. Vice versa, If the nearest distance BC, with the Eccentricity of the subsequent Elliptick Orbit, or its periodical time be given; the bigness

ness of the Comet may, on the same grounds, be determin'd also.

LIV. If a Comet descending towards the Sun pass'd near a Planet which had a secondary one revolving about it; unless their situation were so accurately and nicely adjusted that it approach'd equally near to them both, these two Planets would no longer revolve together, but being for ever separated must describe different Orbits about the Sun. This is easily demonstrable; since any diversity of Attraction must change each of their annual Orbits and Periodical times in proportionably different degrees: The least of which were more than sufficient to such a purpose as we here are speaking of.

Coroll. If therefore the Planetary Orbits were all or any of them Originally Circles; and by the Attraction of Comets passing by, were chang'd into Ellipses; The Position of their several Satellites, which they still retain, must have been most wisely and wonderfully adjust-ed, by the Divine Providence, with their fellows; with their Primary Planets; and with the Orbits and Periods of the Comets; without which correspondence the present system of the World must have been vastly alter'd; and the Primary Planets have lost their Attendants for ever.

LV. When therefore the Earth still retains its Secondary Planet the Moon, which at its Original Formation belong'd to it; if its present Elliptick Orbit be the effect of the passing by of a Comet, the time of such passing by must have been about three days after the New or Full Moon. Let o g represent a Section of the Eccleptick Periphery; in which the Earth a is performing its annual course, from West to East, Fig. 2.

or

or from o towards g: Let c be the Moon, performing in like manner, (besides her menstrual revolution the same way, from t by c towards s, about the Earth,) her annual course, with the same Velocity as the Earth, from u towards w, along her Periphery u w, equidistant from the Eccliptick o g: Let n m represent the trajectory of the Comet, intersecting the Line passing through the Sun I i, in the Angle m b i of 12, 14, or 16 degrees more or less: Let b be the Comet descending from n towards m in its approach towards it *Perihelion*: From the Earth's Center, from d and x, (the Line a x being drawn parallel to the Comets Trajectory n m,) let fall perpendiculars to the Trajectory a f, d e, x y. Now if while the Comet were passing from f to y, the Moon stood still, and did not proceed in her annual course along her Periphery u w, she must have been at that Point x, or not above one day past the new at t; and so the nearest distances a f x y being equal, the Attractions of the Earth by the Comet at f, and of the Moon by the Comet at y, would have been equal also; and by consequence this position would have secur'd the future agreement and company of these two Planets, and the time of the passing by of the Comet fix'd to a single day after the New Moon. But by reason of the Moons progressive annual motion along her Periphery u w, while the Comet descends from t towards y; she must have been in that Point of her Menstrual Orbit c, where c d is to c q or d a, as her Velocity to the Comets, or as 7 to 10; that so the Comet descending from its nearest distance to the Earth at f, to its nearest distance to the Moon at e; and the Moon arriving at the same time, by her annual motion, at the Point d, the nearest distances

stances a f ; d e may still be equal ; and the acceleration of the Earth and the Moon may still be the same. Now this being the case ; the place of the Moon c must be about 41, 43, or 45 degrees more or less past the Point t, in its Menstrual Orbit, or the Conjunction with the Sun or three days past the New Moon. And the like will be demonstrated of three days past the Full Moon, by the same figure and reasoning ; if we do but shift the Scene, and let c represent the Earth, and u w the Ecliptick Periphery ; a the Moon, and o g its Periphery. For all the rest remaining as above ; the Angle \angle c a which the Moon a must have pass'd after the full at ζ , being equal to the alternate c a t, would require equal time to be describ'd ; and so the time proper for the situation of the Earth and Moon, (which is equally necessary in this as in the former case) as the Figure represents it, will be three days after the Full ; as this Corollary asserts.

Coroll. If therefore in a given year a Comet in its descent towards the Sun Accelerated the Earth and Moon's annual motions, and thereby chang'd their Orbit from a Circle to an Ellipsis ; when the day of the year, from the place of the Perihelion, were pretty nearly determined ; by this last Lemma, the very day is determined also from the Astronomical Tables of the Conjunctions of the Sun and Moon.

LVI. If our Earth once revolv'd about the Sun in a circular Orbit, whose Semidiameter were equal to the Earth's original distance from the Sun six degrees past its Perihelion, the annual period was exactly equal to 12 Synodical or 13 Periodical Months. 'Tis evident that 12 Synodical or 13 Periodical Months, (equal to each other in the present case,) are 355 days 4 hours

19 minutes. 'Tis also evident that the Eccentricity of the Earth's Orbit, or the distance between the *Focus* and Center of its *Ellipsis*, was, according to the ancient Astronomers, *Hipparchus* and *Ptolomy*, $\frac{21}{1000}$ of the intire middle distance. By the Moderns 'tis found somewhat less, (and those who know Mr. *Newton's* Philosophy will easily allow of some diversity in different ages;) by *Tycho* 'twas determin'd to be near $\frac{18}{1000}$; by *Cassini* since $\frac{17}{1000}$; and last of all by our most accurate Observer Mr. *Flamsteed*, (as he was pleas'd by Letter with great freedom to assure me,) $\frac{1691}{100000}$, or near $\frac{17}{1000}$, as *Cassini* had before determin'd. All which consider'd, we may very justly take the middle between the Ancient and the Modern Eccentricity $\frac{19}{1000}$ for the true original one; and about $\frac{181}{10000}$ or more nicely $\frac{1846}{100000}$ for the difference between the ancient Semidiameter of the circular Orbit, and the middle distance in the present *Elliptick* one; (the point of acceleration being about 6 degrees past the *Perihelion*, not just at it, as is before prov'd.) Then by the Golden Rule, as the Cube of 100000, (the middle distance in the *Ellipsis*,) to the Cube of 98154, (the Semidiameter of the Ancient Circle) so is the square of 525949, (the number of minutes in our present Solar year,) to the square of the number of Minutes in the ancient Solar year, whose Root being 511459 minutes, or 355 days 4 hours 19 minutes, appears to be exactly and surprizingly equal to the Lunar year before mention'd.

Coroll. Upon this Hypothesis the Ancient Solar and Lunar year were exactly commensurate and equal; and 10 days, 1 hour, 30 minutes, shorter than the present Solar year. Which last number tho' it be not equal to the Lunar Epact at present; is yet rightly assign'd; each Synodical Month being (by the quicker angular

angular revolution of the Earth then) so much longer, as upon the whole adjusted, the periods as is above stated : which on calculation will easily appear.

LVII. As Comets agree with Planets in a regular Motion about the Sun, the common Center or *Focus* of our System, so do they as to their bulk and magnitude; being, generally speaking, about the bigness of Planets, as the observations of Astronomers demonstrate.

LVIII. Besides the Bodies of the Comets themselves, which are solid, compact, and durable; there is round about the same a vastly large, thin, pellucid Fluid; containing withal great quantities of Opake or Earthy Particles; constituting together a confused, irregular, unequally dispos'd, and uncertainly agitated Mass of Bodies; whose Diameter is 10 if not 15 times as long as that of the Body it self, and this Mass is call'd the *Atmosphere* thereof.

LIX. By reason of the mutual access, and recess of the Comets to, and from the Sun, their Atmospheres are incapable of attaining, or at least of long retaining any regular and orderly situation and disposition of parts according to the Law of Specifick Gravity. In short, while they are mov'd in so exceeding Eccentric Orbis, they can neither acquire, or at least not long preserve, such a permanent constitution as the Planets have, and as the conservation of Plants and Animals do necessarily require, and are therefore to be look'd upon in their present state as uninhabitable.

LX. But in case the Orbit of a Comet were chang'd into that of a Planet, *i. e.* if its Eccentric *Ellipsis* were turn'd into a Concentric Circle, or an *Ellipsis* not much differing therefrom

from ; at a suitable and convenient distance from the Sun ; there is no reason to doubt but the parts of that confused Atmosphere which now encompass it to such a prodigious distance, would subside and settle downwards according to their several Specifick Gravities ; and both obtain and preserve as settled, fixt, and orderly a constitution as a Planet has : Which Constitution, if the Atmosphere of a Comet were as well predispos'd for the same as the original Chaos of a Planet, would produce a Planet as fit for the growth of Vegetables and the habitation of Animals as that on which we live, or any other in the Solar System.

LXI. Besides the Central Solid, or Body of the Comet, and its vast Atmosphere encompassing it, there is also a long lucid Train, which in the approach to the Sun is by it acquir'd ; and appears to be nothing else but the Lightest and Rarest parts of its Atmosphere rarified by the Sun's heat ; which becoming thereby lighter than the Sun's own Atmosphere, rise in a mist or steam of vapours towards the parts opposite to the Sun ; and are call'd the *Tail* of it.

LXII. This immense Cylindrical Column of rarifi'd Vapour, tho' its Crassitude or Diameter be usually more than 400000 miles, is so very much expanded, and in so exceeding rare a condition, that the fix'd Stars may be discern'd quite through the same.

LXIII. This so rare, fine, expanded Vapour moves regularly with, and accompanies the Comet it self in its intire course, any way whatsoever ; even through the System of the Planets, and that without any disturbance.

Coroll. *The vast spaces between, and beyond the Planets are not full of subtile or ethereal matter ;*
but

but either perfectly, or at least sensibly a real vacuum or void.

LXIV. The *Phænomena* of Comets Motions suppose and depend on the annual motion of the Earth, without which they are insoluble. Thus they sometimes seem to move with greater, sometimes with lesser Velocity, than the rules of their own, or indeed any other regular motion require or permit: Nay sometimes they appear to us Stationary and Retrograde: All which, as in the Planets, will naturally arise from the motion of the Earth, and of the Spectators Eye therewith, and is thence exactly deducible; but without that *Hypothesis*, cannot be accounted for. Thus also towards the end of their appearances they seem to deflect from that great Circle in which they before were seen to move; the motion of the Earth then being more considerable compar'd with that of the Comets; and so causing a more sensible *Parallax* or diversity of appearance than before, while their own motion was so much swifter: And the same is observable in their other *Phænomena*.

Corollary. Hence arises a convincing argument for the annual motion of the Earth: Which, as 'twas known to be necessary to account for the *Phænomena* of Planets before; so now appears no less so in relation to those of the Comets. All the Heavenly Motions at last attesting the truth, and establishing the certainty of the same.

LXV. Some Comets approach in their *Perihelia* so very near to the Sun, that they must be prodigiously heated and scorched thereby; and this to such a degree that they may not be entirely cool'd in very many thousands of years. Thus the last famous Comet 1680, 1681. at its

L

Perihelion

Perihelion on the 8th of *December* 1680, sustain'd a degree of heat 28000 times as great as that we feel with us in Summer; or about 2000 times as intense as is that of a red hot Iron. So that, by Mr. *Newton's* Calculation, if that Comet were as big as our Earth; as Dense and Solid as Iron; and were throughout equally heated to the fore-mention'd degree, 'twould scarce in our Air be fully cool'd in 50000 years. And by consequence in the vastly rarer Atmosphere of the Sun, in which the Heavenly Bodies revolve, not under a vastly longer time.

Corollary 1. Comets do not wholly consist of vapours, exhalations, or such other dissipable matter, as was formerly suppos'd: Otherwise they must have been utterly incapable of sustaining any part of so violent a heat, (which yet we see they sometimes do) without an intire Dissipation and Dissolution.

Coroll. 2. When the Atmosphere of a Comet is chiefly a Fluid, and yet but a small part thereof by the utmost heat capable of rarefaction (which appears from the but small diminution of the Atmosphere when the Tail is largest, and the Heat most intense) 'tis evident that its Fluid is a very different one from those we are here acquainted withal. For when the main bulk thereof retains its constitution and situation quite through the action of the most violent heat imaginable; which would dissipate and rarify all the Watery, and perhaps Earthy parts visible with us; it must, by its mighty density, gravity, compactness, or some other property not belonging to Fluids here on Earth, be incapable of greater expansion than it has of it self; and be a Compact, Dense, or Heavy Fluid, or Mass of Fluids, of which we have no obvious example; and for which we have no proper Epithet or Name amongst us.

Coroll. 3. The Vapour, or the small parts of Water, be the soonest subject to rarefaction; and the
Tail

Tail of a Comet, before its approach to the Sun, be therefore perhaps nothing but a mist or steam of such Vapours; yet may the same Tail after the Perihelion be in part composed of more gross heavy and opaque corpuscles. For when the intenseness of the heat in the Perihelion is sufficient to dissolve and rarifie not vapour alone, but Sulphur, Niter, Coal or other Gross and Earthy Steams and Exhalations; whatsoever of such a Nature the Atmosphere of the Comet contains, will sure be in some sort affected, and elevated with the Vapour into the Tail, upon such an approach of the Comet to the Sun as we are speaking of. Tho' therefore the Tail should be suppos'd in its descent towards the Sun to be pure unmixed Vapour, or Watery Particles, (as withal the outmost regions of the Atmosphere it self in probability are) yet the same Tail after the Perihelion, ought to be esteem'd a more Heterogeneous and impure mixture; especially in the lowest spaces of it, and those parts which are nearest to that Atmosphere it self, from whence the whole does proceed.

LXVI. The Diurnal Motion of Planets is in it self perfectly distinct from, and wholly independent on the Annual. This I hope will be universally granted without any necessity of a demonstration.

LXVII. If a Chaos, i. e. a confused fluid mass or congeries of heterogeneous Bodies, (suppose it were a Comets Atmosphere, or any other such like irregular *compositum* of mingled corpuscles) in its formation were subject only to an Annual motion about the Sun, without any Diurnal Rotation about an *Axis* of its own; the Figure thereof would be that of a perfect *Sphere*; as from the uniform force of Gravity, and consequent equilibration of parts on all sides, is easily demonstrable. But if during its Formation it

had a Diurnal Rotation about an Axis of its own, the Figure thereof, (by reason of the great velocity and consequent *conatus recedendi à centro motus*, diminishing the force of Gravity at the Equatorial parts) would be that of an *oblate Sphaeroid*, such as an *Ellipsis* revolving about its lesser *Axis* would generate.

LXVIII. If a Planet consisted in great measure of an Abyss or Dense Internal Fluid, and a Crust or Shell of Earth plac'd on its Surface; tho' the Diurnal Rotation were not begun at the Formation thereof from a *Chaos*, and so its original figure were *Spherical*; yet upon the commencing of the said Diurnal Rotation, it would degenerate immediately into that of an *oblate Sphaeroid*, and retain it afterward, as well as if it had put on the same at its primary formation.

Corollary. When therefore the greater quickness of the vibrations of the same Pendulum, and the greater gravitation of Bodies near the Poles than the Equator, consequent thereupon, demonstrate the former Regions of the Earth to be nearer its Center than the latter; and that consequently the Figure is that of an *Oblate Sphaeroid*; 'tis evident, that either the Diurnal Motion commenc'd before the Original of its present constitution; or that its internal parts are in some degree Fluid, and so were pliable and alterable on the after commencing of such Diurnal Rotation. And this Corollary extends equally, if not more to Jupiter; whose Diurnal Rotation is quicker than our Earth's, and by consequence its Figure farther from *Spherical*. Thus by Mr. Newton's Calculation the Diameter of the Equator of the Earth is to the Axis thereof only as 692 to 689. But in Jupiter, according to the same Mr. Newton's Calculation Corrected, as about 8 to 7. Which is very considerable and sensible; and accordingly attested to by the concurrent observations of Cassini, and Mr. Flamsteed. LXIX.

LXIX. If such an Upper Crust or Shell of Earth on the face of the Abyfs, were Fix'd and Consolidated before the Diurnal Rotation thereof commenc'd, it would remain intire, continued, and united all the time of its Spherical Figure, or all the time it had no other than an Annual revolution. But by the beginning of the Diurnal Rotation; which would make the surface of the Abyfs and its sustained Orb of Earth put on the Figure of the *Oblate Sphaeroid* before-mention'd; that Upper Orb must be stretch'd, chap'd, and crack'd; and its parts divided by perpendicular Fissures. For the Periphery of an *Ellipsis* being larger than that of a Circle where the *Area* is equal; and the Superficies of a *Sphaeroid* generated by its circumvolution, consequently, larger than that of a Sphere generated by the like circumvolution of the Circle, which is the present case; that Orb of Earth, 'tis plain, which exactly fitted, and every way enclos'd the Abyfs while it was a Sphere, would be too little and straight for it, when it after became a *Sphaeroid*; and must therefore suffer such Breaches and Fissures as are here express'd.

LXX. The state of Nature in a Planet, constituted as above, while it had only an Annual revolution, would be as follows.

(1.) By reason of the same face of the Planet's respecting continually the same *Plaga* of the Heavens, or the same fixt Stars; and its continual parallellism to it self; all the apparent revolution of the Sun must depend on the Annual Motion; and a Day and a Year be all one. This is evident, because, as a Year is truly that space in which the Sun seemingly, and the Earth really performs a single revolution round the Ecliptick; so a Day is truly that space in which

the Sun passes or appears to pass from any certain Semi-Meridian to the same again once: Which spaces of time are here the very same, and so the appellations themselves Year and Day, may indifferently and promiscuously be appli'd thereto.

(2.) The course of the Sun and Planets, (for the fixt Stars were then *Fixt* indeed; having neither a Real nor Seeming motion) must be contrary to what it has appear'd since: Their Rising being then in the *West*, and their Setting in the *East*: Which, from the way of the present Diurnal Rotation, has since, as all know, been quite different.

(3.) There must be a perpetual Equinox, or equality of Day and Night, through the whole Planet; by reason of the Sun's describing each revolution a great Circle about the same, on which alone such an equality depends.

(4.) The Ecliptick must supply the place of an Equator also; and the Torrid, Temperate, and Frigid Zones be almost alike dispos'd with regard to that Circle, as with us they are with regard to the real Equator.

(5.) To such as liv'd under or near the said Ecliptick, the Poles of the World or Ecliptick, the only ones then in Being, would be at the Horizon; and so not elevated or depress'd to the Inhabitants there. But upon the commencing of a quicker Diurnal Rotation the same way with the Annual. The case would be in all these particulars quite different. For,

(1.) By reason of the quickness of the new Diurnal, in comparison of the Ancient and Continued Annual Revolution, Days and Years would be intirely distinct spaces of time: The Sun returning to the same Semi-Meridian very often,

often, while (from one Tropick to another, and so to the same again) he appear'd to have compleated his longer Annual period.

(2.) By the Diurnal Rotation of the Planet from *West* to *East*, the revolution of the Sun, of the other Planets, and of all the Heavenly Bodies, would be from *East* to *West*; and they would all Rise at the former, and Set at the latter part of the Horizon.

(3.) The perpetual *Equinox* would be confin'd to the Equatorial parts of the Planet; and all other Countries would have longer Days in Summer, and shorter in Winter, as now obtains in the World: When only *March 10* and *September 12* have Day and Night equal to each other through the whole Earth.

(4.) The Ecliptick and Equator would be intirely different; the latter a Real Circle, or Line, on the Planet; equally distant from its own proper Poles: The former, confin'd to the Heavens, and not with respect to the Planet, easily to be taken notice of. The Torrid, Temperate, and Frigid Zones would regard the new Equator, and be from it distinguish'd and dispos'd almost in the same manner as before they were from the Ecliptick, and that with greater niceness, and more exact boundaries.

(5.) The Poles of the World which before were to the Inhabitants at or near the ancient Ecliptick, neither elevated nor depress'd, but situate at the Horizon, would seem intirely chang'd, and particularly at the Intersection of such ancient Ecliptick, and the succeeding Northern Tropick, the Northern Pole would appear to be elevated above, the Southern depress'd below the Horizon; and the Sun and Planets, whose Motions were before over the *Vertex*, and

at right Angles with the Horizon, would appear inclin'd or bent towards the Southern parts; and that way become oblique, and at unequal Angles with the Horizon for ever after.

Corollary 1. *To the Inhabitants of that place last mention'd, the beginning of the Night, and of the Autumn; or Sun-set, and the Autumnal Equinox, would in such a Primitive State of a Planet, be exactly Coincident: And vice versa, the place to which they were so coincident, was that Intersection just now assign'd, or at least under the same Meridian therewith.*

Coroll. 2. *Such a Planet would be more equally habitable in the Second than in the First State. For from the Spherical Figure of the Planet at first, the Central Hot Body, (of which hereafter) would equally reach all the Regions; and the Sun chiefly affect the Torrid Zone; and still less the Temperate, but least of all the Frigid ones; as he does at present. So that if any one of these Climates, by reason of the due proportion of heat afforded it from the Sun, were habitable, neither of the other could with any sort of equality be so too. But when the Figure of the Planet became an oblate Spheroid, (as on the commencing of the Diurnal Rotation we have shew'd it would) the proportion of heat would be upon the whole more equable through the several Climates of the Planet; the greater vicinity of the Central Hot Body to the Frigid Zones, in some measure compensating the greater directness of the Sun's Position to the Torrid one; and rendering the compleat surface of the Planet pretty universally habitable on account thereof.*

Coroll. 3. *Where the States of External Nature are so very different (as on the same Planet before and after its Diurnal Rotation begin, they appear to be) 'tis reasonable to suppose, that the Natures, Constitutions, and Circumstances of Creatures, which were the Inhabitants in such different States, must be suitably*

*vid. Arg. 7:
Hypoth. 1.
infra.*

suitably and proportionably different from one another.

Coroll. 4. *'Tis therefore, without due allowance for every thing, very unsafe arguing from one State or its Circumstances to another; and very unjust to conclude things unaccountable or absurd in one, only because they are strange and unknown to the other State. The like is to be said of Phrases, Descriptions, or Relations concerning one, which may easily be misunderstood in the other, without an exact Consideration and Allowance for the Diversity of things belonging thereto.*

LXXI. If the Atmosphere of a Comet, or any other such a fluid confused *Chaos*, were by a regular and orderly Digestion and Subsidence brought into a consistent and durable state, the universal Law of specifick Gravity must prevail, and each Mass take its place, generally speaking, according to it (whether 'twere fluid or solid) from the Center to the Circumference of the whole.

LXXII. Fluids are capable of all degrees of Density and specifick Gravity, as well as Solids. Thus the Proportion of the heaviest and lightest Fluids, Quicksilver, and Oyl, are nearly as fifteen and one; when yet the Proportion of the heaviest solid, Gold, and the lightest Earth or Mold which we find here, is not quite as ten to one. On which account 'tis highly reasonable to allow that possibly there may be as much Variety and Diversity in the Fluids belonging to a Planet, as we see there is in the Solids thereof.

Corollary. *From these two last Lemmata, it appears as reasonable to suppose a great part of the internal Constitution of a Planet to be a Fluid, or System of Fluids, as to be a Solid or System of firm and earthly Strata, which yet is usually suppos'd; and which*
of

of these Hypotheses best suits the Constitution of the Original Chaos, and the Phænomena of Nature afterward, is in reason to be embrac'd.

LXXIII. In the Formation of a Planet from a *Chaos*, it must be much more rare and unusual to lodge very heavy Fluids near the superficial Regions, among Bodies of a lighter and rarer Texture, than Solids equally so. For the Corpuscles of very dense and heavy Solids, when they are once entangled among, and mixed with others, tho' of very different density and specifick Gravity, must afterward, let the place proper for Bodies of their weight be never so much nearer the Center, lye according to their first casual Situation. Thus if you take dust of Gold, Silver, or Brass, with Sand, Gravel or Saw-dust, and mix them, or let them subside indifferently together, as they place themselves at first, so, notwithstanding their different weight, will they be situate ever after. But in Fluids the case is quite otherwise, for they will obtain their due place, not only when mixed with Fluids, but with any solid Corpuscles whatsoever. Nay, besides that, they will penetrate the Interstices of heavier Bodies than themselves; and unless where they are firmly consolidated or conjoin'd together, will settle into, and fill up the same, without any regard to the Situation according to specifick Gravity. Fluids are compos'd of moveable, separable parts, diffusing, subsiding, and flowing every where, and thereby will be so far from resting at Regions too high and remote from the Center, considering their specifick Gravity, that how light soever they are, unless the earthy Parts under them be either fixt and consolidated, or their Interstices already intirely fill'd and satur'd

turn'd, they will insinuate themselves, and by degrees approach as near as possible to the Center of that Planet to which they belong.

Corollary 1. *Tho' our Earth should contain vast quantities of dense and heavy Fluids within, as well as like dense and heavy Solids; yet 'tis more strange that we have near the Surface one Specimen of the former, (viz. Quicksilver) than that we have so many sorts, and so much larger Quantities of the latter (the Mineral and Metallick Bodies) much denser and heavier than that common Earth among which they are found.*

Coroll. 2. *No Argument can be drawn from the variety of dense and heavy Solids, and the single instance of a dense and heavy Fluid, to prove the improbability of a vast subterraneous dense and heavy Fluid, or System of Fluids, on whose Surface our Orb of Earth may be suppos'd to rely; if the other Phenomena of Nature require such an Hypothesis.*

LXXIV. If a *Chaos* were chiefly compos'd of a dense Fluid, of greater specifick Gravity than its solid dry or earthy Parts, the place of such a dense Fluid upon a regular Formation, would be nearest the Center, and the solid or earthy Mass would encompass it round, enclose it within it self, and rest upon its Surface; and *vice versa*, if an Orb of Earth be situate on the Surface of a Fluid, that Fluid is denser and heavier than the intire Columns of such an Orb of Earth consider'd together.

LXXV. If a Solid be either contain'd in, or fall upon a Fluid of greater specifick Gravity than it self, it will neither sink to the bottom, subside intirely within, nor emerge quite out of the same; but part of it remaining immers'd, the other part will be extant above the Surface of the Fluid;
and

and that in a different degree proportionably to the different specifick Gravity of the Solid, compar'd with that of the Fluid.

LXXVI. Such a Solid will continue to that certain depth immers'd in the Fluid before-mention'd, that if the space taken up thereby were fill'd with the Fluid, that Portion of the Fluid were exactly equal in weight to the whole Solid. Thus, if a Cube of Wood or Brass were immers'd in a Fluid of twice its specifick Gravity, it would one half subside within, and the other half be extant above the Surface of the Fluid. If it were immers'd in a Fluid of thrice its specifick Gravity, two thirds of it would be extant, and but a third part inclos'd within the said Surface, and suitably hereto in all other Proportions whatsoever. These two Propositions are demonstrated by *Archimedes*, and are the known Foundations of *Hydrostaticks*.

LXXVII. If therefore solid Bodies, equal in visible Bulk, or taking up equal Spaces, but of unequal density and specifick Gravity, rest upon the Surface of a Fluid denser and heavier than themselves, they must remain immers'd in the same in different degrees; the heaviest sinking deepest, and the lightest being the most extant above the Fluid. Thus, if six several Cubes of equal apparent Magnitude, made of Gold, Lead, Silver, Brass, Iron, and Stone, were laid upon the same Fluid, denser and heavier than any of them, every one severally would sink so much deeper as it was heavier, and thereby the upper Surface arising from them all, become very unequal.

LXXVIII. If upon the first general Digestion and Separation of Parts in a *Chaos*, the upper Regions are for the most part compos'd of liquid or fluid Bodies, with only a few dry, solid, or earthy
Parts

Parts intermixt; the outward Surface, after the Formation is intirely over, will be smooth and even, as the Surface of Liquours constantly of it self is. But if, on the contrary, the quantity of dry, solid, or earthy Parts be vastly greater than of the liquid or fluid ones, the Surface will be rugged and uneven, by the different degree of the Immersion of the different Columns thereof, in that dense Fluid or Abyss upon which the Orb is plac'd.

Corollary 1. *In the former case all the Corpuscles will obtain their proper place, (the Fluidity freely permitting their passage) according to their respective specifick Gravity. But in the latter they must take their places rather according as they chanc'd to be before situate, than according as their specifick Gravity would of it self determine them. The case of that part of the Lemma, and of this Corollary, being almost the same with that before mention'd; where the Dust of Gold, Silver, or Brass, with Sand, Gravel, or Saw-dust, are suppos'd to be let fall uncertainly upon a Fluid heavier than the whole mixed Mass taken together; For those Columns where the Gold, and other Metallick Dust were predominant sinking farthest, and those where Sand or the other lighter Particles were so, not so far into the Fluid; the upper Surface must be uneven, and withal the several Species of Corpuscles retain that place where they chanc'd to be at first dispos'd, without any possibility of recovering any other which by the Law of specifick Gravity were due to them.*

Coroll. 2. *If therefore the upper Regions of a Chaos, whose quantity of Liquid is very small in comparison of its solid Corpuscles, do subside into a Fluid of greater specifick Gravity than its own Columns taken together are; an Orb of earth will be compos'd on the Surface of the Fluid, and its different Columns*
being

being made up of Bodies of very different Natures and specifick Gravities, (as must happen in such a confused heterogeneous Mass, as we call a Chaos, particularly the Atmosphere of a Comet) that Orb will sink into the Fluid in different degrees, and thereby render its Surface unequal, or distinguished into Mountains, Plains, and Vallies. So that by how much any Column was compos'd of rarer, more porous, and lighter Bodies, by so much would it produce a higher Mountain; and in like manner, by how much a Column was compos'd of more close, fix'd, dense and solid Bodies, by so much would it produce a lower Valley; and so vice versâ, the higher any Mountain, the more rare, porous, and light its Column; and the lower any Valley, the more fix'd, close, dense, and solid its Column must needs be suppos'd.

Coroll. 3. If therefore any Planet be immediately on its first Formation of an unequal Surface, compos'd of Mountains, Plains, and Valleys; and the order of its internal Strata be disagreeable to the Law of specifick Gravity; it has exactly proper Indications to prove, that the quantity of Fluids in the upper Regions was originally small in comparison of its earthy Parts, and that such an uneven Orb is situate on a Fluid denser and heavier than it self. [Which case how exactly it corresponds to the known Circumstances of our Earth, is left to the consideration of the Reader.]

LXXIX. If any of the Heavenly Bodies be plac'd near a Planet, by the inequality of its Attraction of the Parts at unequal distances from it, a double Tide, or Elevation of the Fluids thereto belonging, whether they be inclos'd within an Orb of Earth, or whether they be on its Surface above, must certainly arise, and the Diurnal Rotation of such a Planet being suppos'd,

pos'd, must cause such a successive Flux and Reflux of the said Fluids, as our Ocean is now agitated by. Thus, if $a d b c$ be the Earth, and $b i D h$ be a Comet, or any one of the Heavenly Bodies plac'd near the same, and the upper Orb of Earth be situate above a vastly large fluid Abyss, the Comet or Heavenly Body will considerably more attract the nearer parts about b , than it does those about the Line $d c$, or the middle parts of the Earth; by which Attraction wherever the Particles attracted are not solid, fixed, and unmoveable, they will be elevated or raised into a Protuberance $d b c$. In like manner, the Comet or Heavenly Body will considerably more attract the middle parts near the Line $d c$, than those more remote about a , and thereby occasion their slower Motion towards it self, than that of the foresaid middle parts; and consequently permit them to remain farther off the Center; or which is all one, to elevate themselves into the opposite Protuberance $d a c$. And this Effect not depending on the Situation of the Fluid under the Orb of Earth, is equally evident with respect to the Atmosphere and Ocean upon, as any Abyss beneath the same, and so must cause a double Tide or Elevation of the Fluids of the Globe. And this double Tide, by the Diurnal Rotation of the Earth from *West* to *East*, will shift continually from *East* to *West*, and cause that Elevation and Depression of the Ocean twice each Revolution, which we so wonder at, and take so much notice of amongst us.

Corollary 1. *When therefore the Vicinity of the Moon, and the Vastness of the Sun's Body, make their force considerable with regard to the Fluids of our Earth, their several Attractions must produce two se-*

veral

Fig. 7.

veral double Protuberances, Tides, or Elevations of the Ocean and Atmosphere thereof; whence must arise very remarkable Phenomena relating thereto; of which in the following Corollaries.

Coroll. 2. The sensible Elevation or Tide would be only double, as if it arose from one of the Luminaries, but such as from the Composition of their attractive Power were to be expected.

Coroll. 3. When therefore the Sun and Moon's Forces unite, or when they are situate in or near the same Line through the Center of the Earth, which happens only at the New and Full Moon, the Tides must be the greatest; and when their Forces contradict each other, or when they are situate in the middle between the New and Full, at the Quadratures, the Tides must be the least. In the former case, the visible Flux and Reflux arises from the Summe; and in the latter, from the Difference of their Attractions; and so the Spring-Tides, after the New and Full, are the result of the Elevation and Depression of both the Sun and Moon conjointly; but the Nepe-Tides, after the Quadratures, the result only of the prevailing Elevation and Depression of the Moon above those of the Sun; and by consequence, exactly agreeable to experience, much less than the other.

Coroll. 4. As if the Luminaries were situate in the Axis of the Earth, the Diurnal Revolution would not more expose any places to their force one time than another, and no Reciprocation of Flux and Reflux would arise; so the nearer they are to such a Position, the less must such a Reciprocation be, and the farther from such a Position, the greater. On which account, The Elevation or Tide must be greater after the Equinoxial New and Full Moon, than after the Solstitial; and the highest Spring-Tides be those about March 10. and September 12. as all Experience attests them to be; and the Situation of the Luminaries

near

near the Equator of the Earth, and farthest from the Poles, does require.

Coroll. 5. *When by the Vicinity of the Moon, the visible Tides follow her Influence; and when withal our Earth in about $24\frac{1}{2}$ Hours, recovers the same Situation with regard to her; 'tis evident, That in the said space, each Part of the Ocean must have twice been elevated, and twice depress'd, or had a double Flux, and double Reflux of its Waters, as all Observation assures us it really has.*

LXXX. The Elevations or Tides caused by two different Bodies at the same distance, are always proportionable to the Quantity of Matter in the same attractive Bodies; as from the force of Gravitation in general, proportionable to the attracting Body, will easily be understood. Thus if a Comet or Planet, whose Quantity of Matter were ten or twelve times as much as the Moon's, were at an equal distance with her from the Center of the Earth, the Tides, whether of the internal Abyss, if such there be, or external Air and Water, would be ten or twelve times as high as those she is the cause of with us.

Vid. Lem.
7. prius.

LXXXI. The Elevations or Tides caused by the same, or an equal Body at various distances, are reciprocally in a triplicate Proportion of such distances. Thus if the Moon should approach as near again to the Earth's Center, as now she is, the Tides would be eight times as high; if thrice as near, twenty seven times as high; if four times as near, sixty four times as high as those she at her present distance produces.

Corollary 1. *Hence appears (which Mr. Bentley*

Serm. 3.
p. 14.

has in part also observ'd) a signal Instance of the Divine Providence respecting the Constitution of the World, in placing the Heavenly Bodies at so vast a

M

distance

distance from each other, and the greatest at the greatest distance, that when we consider it, we cannot but be amazed at it. For had they been situate any whit near to one another, they would have caus'd prodigious Disorders; and in particular, such destructive Tides, whenever there was vast quantities of Fluids, or a great Ocean, that neither Plant nor Animal could have avoided its force, or sustain'd its fury, which by the wise placing the Heavenly Bodies at so vast a distance is entirely prevented.

Coroll. 2. The same careful Providence is alike, and on the like accounts, conspicuous in the smallness of the secondary Planets; whose nearness otherwise being so great, must have been attended by the foremention'd Inconveniences, but is now perfectly secure from them. Thus for instance, our secondary Planet, the Moon, which is so near to us, is withal so small, (but the 26th part so big as the Earth, not the 700th part so big as Saturn, nor the 1400th as Jupiter, nor near the millioneth as the Sun) that the Tides so caused are but of some few Feet in height, very moderate, not at all incommodious, nay in truth very advantagious to us, which in the other secondary Planets is also no less true, and no less remarkable.

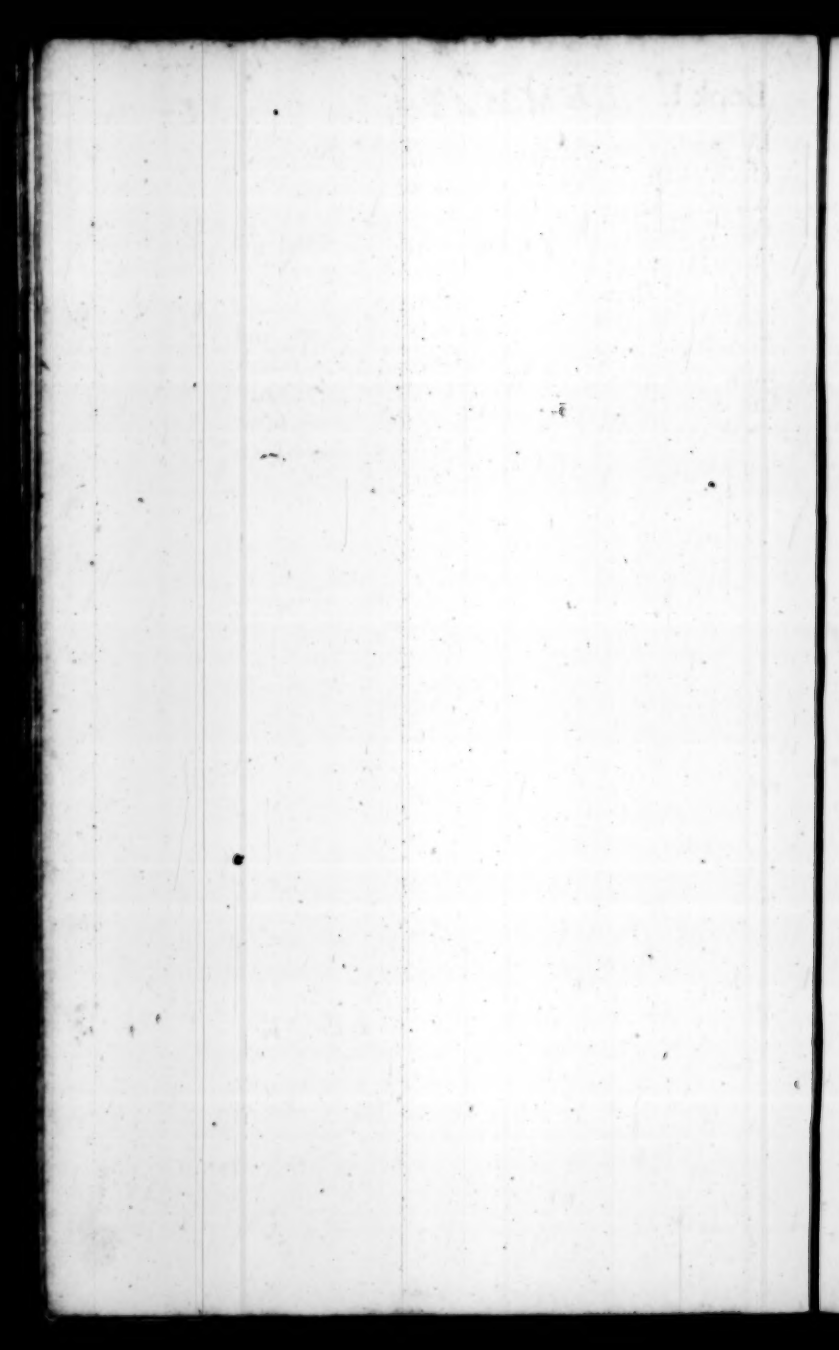
LEM 33.
p. 111.

Fig. 7.

I. XXXII. Of the two Protuberances produc'd by the presence of a Comet, or other Cœlestial Body, that which is directly towards that Body, as $d h c$, is larger and higher than the opposite one, $d a c$. This is *a priori* demonstrable, and found agreeable to experience also.

LXXXIII. If such a double Tide were very great, and should on a sudden be produc'd in a subterraneous Abyfs, on whose Surface an Orb of Earth, fix'd and consolidated together, were situate, it would raise or depress the Regions of that Orb, as it self was rais'd or depress'd; and by

by putting on the Figure of an *Oblong Sphaeroid*, (such as an *Ellipsis* revolving about its longer *Axis* would generate) and thereby increasing its Surface so much, that the Orb of Earth could not fit and enclose it Uniformly as before, would strain and stretch the said Orb of Earth, would crack and chap it, and cause Fissures and Breaches quite through the same. All which is easily understood from what has been already said of a Case very agreeable to this we are now upon, and so can stand in need of no farther Explication here.



 BOOK II.

HYPOTHESES.

 I. **T**HE Ancient *Chaos*, the Origin of our Earth, was the Atmosphere of a Comet.

This Proposition, however new and surprizing, will, I hope, appear not improbable, when I shall have shewn, That the Atmosphere of a Comet has those several Properties which are recorded of the Ancient *Chaos*: That it has such peculiar Properties besides, as lay a rational Foundation for some of those *Phænomena* of our Earth, which can scarce otherwise be Philosophically explain'd; and that no other Body, or Mass of Bodies now known, or ever heard of in the World, can stand in Competition, or so much as pretend to the same Character, which it so agreeably corresponds to: Which will be the design of, and shall be compriz'd under the following Arguments.

See the Testimonies about the Chaos cited at the first Phænomenon afterward.

(1.) The Names of these two Bodies, or Systems of Bodies, are exactly the same, and equally agreeable to the Nature of each of them. The Original *Chaos*, by the Ancient Tradition of the *Phœnicians*, was stil'd, 'Αἰὲρ ὁρατός καὶ πνευματικός, & Πύρρον 'Αἰὲρ ὁρατός; in English, A dark and stormy Atmosphere. Which Appella-

tion, (the constant Character of that Mass encompassing the Body of a Comet, and at the same time of the old *Chaos*) if we suppose it to have been as firly by Antiquity appli'd to the latter, as certainly, Observation being judge, it is to the former; is as proper a one for our present purpose, as could possibly be desir'd.

(2.) The main bulk of the ancient *Chaos*, and of the Atmosphere of a Comet, is a Fluid, or System of Fluids. As to the former, 'tis both necessary to be presuppos'd in order to the succeeding Separation, and regular Disposition of the Parts; and is confirm'd by all the Accounts of it. But *Moses* himself being exprefs, I shall content my self with his single Testimony; who not only calls it an *Abyss*, but gives it the stile of *Waters*. *Darkness was upon the face of the deep, and the Spirit of God moved upon the face of the waters.* Now, that the main part of a Comet's Atmosphere is also a Fluid, appears both by its Pellucidness, (a thing unusual in Bodies, but such as are, or once were in a fluid Condition) and by those perpetual Changes and Agitation of Parts within the Regions of it, which in any other than a Fluid are plainly impossible; and which indeed, withal, have hitherto seem'd so visible and remarkable, that thence men were ready to imagine the whole Mass to be nothing else but a Congeries of Vapours or Clouds, uncertainly jumbled together, and as uncertainly dissipated again.

(3.) The *Chaos* is describ'd to have been very stormy and tempestuous; of which some of the Ancient Writers take particular notice. To which those frequent and violent Agitations and Changes, those strange, uncertain Hurries of Opake Masses hither and thither, which the

Phænomena

Phænomena of Comets Atmospheres present us with, most exactly agree.

(4.) The *Chaos* was a mixed Compound of all sorts of Corpuscles, in a most uncertain confus'd and disorderly State; heavy and light, dense and rare, fluid and solid Particles were in a great measure, as it were at a venture, mingled and jumbled together. The Atoms, or small constituent Parts of Air, Water, and Earth, (to which, together with Fire, the name of *Element* has been peculiarly appli'd) every one were in every place, and all in a wild and disturbed Confusion. This is the very Essence, and enters the Definition of a *Chaos*; in which therefore all both do, and must agree. And if any one carefully consider the perpetually various Visage of a Comet's Atmosphere, its vast Extent, the no manner of Order or Method of its several Appearances, and remember that in some Comets it has in its near approach to the *Sun*, been scorch'd and burn'd by a degree of heat many hundred times as Intense as the *Sun's* is with us in the midst of *Summer*, he will not wonder that I assert the Parts of this Atmosphere to be in a perfectly confus'd and *Chaotick* Condition. One might indeed as well, and as reasonably, expect Order and Method in the ruinous Reliques of a City burnt to Ashes, or in the Smoke proceeding from the same, as in several, at least, of those Atmospheres we are speaking of.

(5.) The ancient *Chaos*, just before the beginning of the six days Creation, was very dark and caliginous. *Darkness was upon the face of the deep*, says the Sacred, and the very same say the prophane Writers. Now, when we every Year see how far that small Company of col-

lected Vapours, of which a Cloud consists, can go towards causing darkness on the Face of the Earth; we may easily guess how thick the Darkness of the Comet's Atmosphere must needs be, when all those earthy and watery Corpuscles, which flying up and down in the vast Regions thereof do now so often, and so much obscure the Comet's central Body, and are here so very sensible; when all these, I say, shall rise up, and make a confus'd cloudy Orb on the more confin'd Surface of the Atmosphere of some scores, if not hundreds of Miles thick, as must happen in the beginning of its Formation. If this be not sufficient to account for this thick *Darkness on the Face of the Abyss*, 'twill, I imagine, be difficult to solve it better.

(6.) Our upper Earth, the Product of the ancient *Chaos*, being in all probability founded on a dense Fluid or Abyss, as will appear in the Sequel, the main part of the Fluid of that ancient *Chaos*, by consequence must have been such a dense and heavy one as is here mention'd. And indeed, 'tis in it self but very reasonable, if not necessary, to allow the inferior Parts of a fluid *Chaos*, to have been compos'd of much denser and heavier Masses than the superior, or than Water, the main visible Fluid of our Globe. For, if we consider the matter in any sort according to the Law of specifick Gravity; all heavy Fluids must, at least, as certainly be near the Center, as like heavy Solids; and 'tis but mechanical to allow that in a confused Fluid in *some measure*, as well as *exactly* in a digested one, the Fluids contain'd in the inner Regions must be much heavier than those at or near the outer Surface thereof. But besides, 'twill be hard to account for the confus'd moving state of

of the earthy Parts, or, which is much the same, the fluidity of the intire *Chaos*, without allowing a much greater quantity of Fluids in it, than what we now see with us, the Waters of our present Earth; and those of a Density and Gravity fit to retain their Posts, as well nearer the Central, as the superfiary Parts. And that on *this* account, (of the Comet's Atmosphere's fixed and dense Fluid) 'tis peculiarly adapted to the forefaid Description of the *Chaos*, is evident by what has been already observ'd of the same; to which I refer the Reader for satisfaction.

(7.) Whereas very many, and very considerable *Phænomena* of Nature, (which Dr. Woodward has excellently observ'd) as well as ancient Tradition, require and suppose a Central Fire, or internal Heat diffusing warm and vigorous Steams every way from the Center to the Circumference of the Earth; and whereas 'tis very difficult on the common *Hypotheses*, or indeed on any hitherto taken notice of, to give a Mechanical and Philosophical Solution of the same: If we will but allow the Proposition we are now upon, and that the Earth, in its *Chaotick* State, was a Comet, a most easy and Mechanical Account thereof is hereby given, and the *Phænomena* of Nature rendred plain and intelligible. For a Comet, besides its thinner fluid Atmosphere, consisting of a large, dense, solid, central Body; and sometimes approaching so near the Sun that the immense Heat acquir'd then, tho' sooner failing in the thinner and expos'd Atmosphere, will not do so in the central Solid, under very many thousands of Years; nothing can better suit the case of our present Earth, than to allow a Comet's Atmosphere to have been her *Chaos*; and the Central Body of the Comet, the Source
and

Coroll. 2:
Lem. 65.
prim.
Essay, Part
3. Sect. 1.

Vid L. m.
65. prim.

and Origin of that Central heat, which our Earth appears still to inclose within it.

(8.) The bigness of Comets and their Atmospheres agrees exactly with the supposition we are now upon. For tho' the Atmospheres are 10 or perhaps 15 times in Diameter as big as the Central Bodies, (which yet have been formerly observ'd to be near the Magnitude of the Planets) and thereby of a much larger capacity than this Argument supposes; yet if, from that thin, rare, expanded state in which they now are, they were suppos'd to subside or settle close together, and immediately rest upon the Central Body; as on a Formation they must do; the intire mass would make much such Bodies in Magnitude, as the Planets are: As Astronomers, from the observations made about them, must freely confess. So that when to all the other inducements to believe these Atmospheres to be the same Masses of Bodies we call *Chaos*'s, (from one of which all Antiquity Sacred and Prophane derive the Origin of our Earth) it appears that the Magnitude is also exactly correspondent; I know not what can be alledg'd to take off or weaken the force of them. Which general conclusion might be confirm'd by some other similitudes between them and the Planets, observable in the succeeding Theory, or probably deduc'd from their *Phænomena*; which I shall not at present insist particularly upon. So that on the whole matter, upon the credit of the foregoing Arguments united together and conspiring to the same Conclusion; I may, I think, venture to affirm, That as far as hitherto present Nature and Ancient Traditions are known, 'tis very reasonable to believe, that a *Planet* is a *Comet* form'd into a regular and lasting constitution,
and

*Len. 57,
58. print.*

*Vid. Newt.
p. 508. &
Coroll. 1.
Solut. 71.
infra.*

and plac'd at a proper distance from the Sun in a Circular Orbit, or one very little Eccentric; and a *Comet* is a *Chaos*, i. e. a *Planet* unform'd, or in its primæval state, plac'd in a very Eccentric one: And I think I may fairly appeal to all that the most Ancient History, or Solid Philosophy can produce hereto relating, in attestation to such an Assertion. Especially considering withal,

(9.) Lastly, That there is no other pretender, no other *Mafs* of Bodies now known, or ever related to have been known in the whole System of Nature, which can stand in competition, or so much as seem to agree to the description of the Ancient *Chaos*, but that which is here assign'd and pleaded for. Now this I am secure of, and all will and must grant: They cannot but be forc'd to confess, that, (the Atmosphere of a Comet set aside) they have no other *Idea* of the Nature and Properties of that *Mafs* of Bodies call'd a *Chaos*, but what profane Tradition, with the concurrence of the Holy Books, afford them; without any visible instance or pattern in Nature. Which acknowledgement, join'd to the remarkable correspondence of the particulars before-mention'd; and the no objection of any moment, as far as I see, to be produc'd to the contrary; is, I think, a mighty advantage in the present case. All that can reasonably be requir'd farther is, that the *Phænomena* of the Earth, to be superstructed on this foundation, and deriv'd successively through the several Periods, to the consummation of all things, prove coincidents to this *Hypothesis*, and confirm the same: Which being the attempt of the following Theory, must be by no means here pretended to before-hand; but left to the Impartial Judgment of the Reader, when

when he is arriv'd at the end of his Journey, and digested the whole Scheme. From the intire and conjoint View whereof, and not from any particulars by the way occasionally reflected on, a prudent and well-grounded Sentence is to be pass'd upon it, and upon several of the *prior* Conclusions themselves also. However, when here is a known and visible foundation to depend on; and the Reader is refer'd to no other *Chaos* than what himself has seen, or, 'tis probable, may in a few years have opportunity of seeing; it must be at the least allow'd a fair and natural procedure, and of the consequences whereof every thinking and inquisitive Person will be a proper Judge. The reasonings proceeding, without begging any precarious *Hypothesis* at first, of the nature of that old fund and promptuary whence all was to be deriv'd, or sending the Reader to the utmost Antiquity for his Notion thereof; to which yet, in the most Authentick accounts of the Primitive *Chaos* now extant, I fear not to appeal, and submit my self.

II. The Mountainous Columns of the Earth are not so dense or heavy as the other Columns.

This Proposition will also I imagine, be new and unexpected to very many; but I hope the following Arguments, which I shall very briefly propose, will demonstrate it to be no unreasonable or precarious one.

(1.) Mountains are usually Stony and Rocky, and by consequence lighter than the main Body of the Earth. For tho' Stone be somewhat heavier than
the

the uppermost *Stratum* or *Garden Mold*, as some stile it; yet 'tis considerably lighter than that beneath the same. For if we compare its weight with that in the bottom of our Mines, which is alone considerable to our purpose, (our upper *strata*, as will hereafter appear, being generally factitious, or acquir'd at the Universal Deluge) we shall be forc'd to own the necessity of the consequence of the present Argument. The Specifick Gravity of Stone, is to that of Water, as 14 to 5 $\frac{1}{2}$; but the Specifick Gravity of the Earth at the bottom of our Mines, is to that of Water, as 3 to 1, sometimes as 4 to 1, nay sometimes almost as 5 to 1, and therefore to be sure considerably Denfer and Heavier than Stone. So that were the Mountainous Columns of the Earth intirely made up of Stone, they would, (without the consideration of those empty Caverns they inclose) be plainly the lightest parts of the whole Earth. Newt. p. 417.

(2.) Those very Dense and Heavy Corpufcles of Gold, Lead, Silver, and other such like Metals and Minerals, are mostly, if not only, found in the Bowels of Mountains. Now, when the Gravity of these Bodies is so great, that in a regular formation they ought to have seated themselves, one would think, much nearer the Center, than they now are; to account for such their position, it must be suppos'd, that the Columns under them, and the Earth among them, were lighter and rarer than the Neighbouring Columns did afford; that upon the whole, the intire *Compositum* or Mass taken together, may be allow'd to be, if not lighter, yet, at least, not heavier than others at the same distance from the Center. So that by a just, tho' a little surprizing way of reasoning, from the greater weight of some parts of the Mountainous Columns, the less weight of the whole is infer'd. (3.)

Essay.
Part 3.

(3.) Mountains are the principal Source and Origin of Springs and Fountains. Now Dr. *Woodward*, from his own observations, asserts, That these are neither deriv'd from Vapours condens'd in the Air at the Tops of Mountains, nor from meer Rains, or fall of Moisture, as several have differently asserted; but from the Waters in the Bowels of the Earth; and that 'tis a Steam or Vapour rais'd by the Subterraneous Heat which affords the main part of their Waters to them. On which Hypothesis, which I take to be the truest, and most rational of all others, the Vapours appear to have a more free and open vent or current up the Mountainous Columns, than the neighbouring ones; and consequently, They are more rare; laxe and porous, or less dense and weighty than the others.

(4.) All *Volcano's*, or subterraneous Fires, are in the Bowels of some Mountain, to which a Plain or a Valley was never known to be liable. Which observation affords a double Argument for such a levity and rareness as we are now contending for: The One, from the temper of an inflammable Earth, Sulphureous and Bituminous; which being in part made up of Oily Particles, the lightest Fluid we have, must in likelihood be the lightest of all *Strata* whatsoever. The other, from the free admission of Air into the Bowels of these Mountains; without which no Fire or Flame can be preserv'd: Which also infers such a porosity and laxeness as we are now concern'd to prove.

(5.) Mountainous Countries are chiefly Subject to Earthquakes, and consequently are as well Sulphureous and Inflammable, as Hollow and Cavernous, Loose and Spungy in their inward parts; without which properties the *Phænomena* of

of Earthquakes were difficultly accountable: Especially according to Dr. Woodward's Hypothesis of them; who deriving them from steams of Subterraneous heat ascending from the Central parts, and collected in great quantities together, must by consequence own that the Bowels of Mountains, so commonly subject to Earthquakes, are most Pervious, Porous, and Cavernous of all other. All which Arguments, especially taken together with some other coincidences hereafter observable, will, I hope, be esteem'd no inconsiderable evidence of the Truth of the Proposition we are now upon.

III. Tho' the *Annual Motion* of the Earth commenc'd at the beginning of the *Mosaick Creation*; yet its *Diurnal Rotation* did not till after the *Fall of Man*.

Tho' I cannot but expect that this will appear the greatest *Paradox*, and most extravagant Assertion of all other, to not a few Readers; yet I hope to give so great evidence for the same from Sacred as well as Prophane Authority, that competent and impartial Judges shall see reason to say, that if it be not sufficient to force their assent, yet 'tis such as they did not expect in so surprizing, remote, and difficult a case; the Records relating to which (the Sacred Ones excepted) are so few, so dubious, and so ancient; and the constant opinion of the World, within the Memory of History, so fixt and settled on the contrary side. Let it only be, by way of Preparation, remark'd, That the Annual and Diurnal Motions are in themselves

Lem. 66.
prior.

wholly

wholly independent on each other, as was before taken notice; and consequently, that 'tis as rational to suppose the former without the latter, if there be evidence for the same, in the Original State of Nature, as 'tis to believe them capable of being conjoin'd, from the known *Phænomena* of the World, in the present state. Let it also be observ'd, that there is yet no evidence that either the Central Bodies of any of the Comets, or that even several of the Planets, who undoubtedly have an Annual Motion about the Sun, have yet any Diurnal Rotation about *Axes* of their own: And let it, lastly, be consider'd, that when the Diurnal Rotation must have an Original, a time when it began; that time may as rationally and naturally be suppos'd after the Fall, as before the Creation, or Six days Work; and which was the true and real one, must be determin'd by the Testimonies of Antiquity, or other Collateral Arguments to be from thence, or from the *Phænomena* of Nature Ancient or Modern, deriv'd and infer'd. Which things beings suppos'd, I thus attempt to prove the present Assertion; If the Primitive State of Nature before the Fall, had those peculiar *Phænomena* or Characters which certainly belong to a Planet before its Diurnal Rotation began; and are as certainly impossible in the present state of the Earth revolving about its own *Axis*; 'tis plain the Assertion before us is true and real: But that those peculiar *Phænomena* or Characters did belong to that Primitive State, the Testimonies of Sacred and Profane Antiquity, to be presently produc'd, do make appear; and by consequence the Assertion before us is true and real. The *Phænomena* or Peculiar distinguishing Characters here intended have been already mention'd, and are

are these five. (1.) A Day and a Year are all one. *Lem. 70^o prius.*
 (2.) The Sun and Planets Rose in the *West* and Set in the *East*. (3.) There was through the whole Earth a perpetual *Equinox*. (4.) The Ecliptick and Equator were all one; or rather the latter was not in Being, but all the Heavenly Motions were perform'd about the same invariable *Axis*, that of the former. (5.) To such as liv'd under the Ecliptick, the Poles of the same (or of the World, they being then not different,) were neither elevated nor deprest, but at the Horizon. These are the certain and undeniable Characters of such a state: And that they belong'd to the Primitive State of our Earth, before the Fall, I am now to prove.

(1.) In the Primitive state of the World Days and Years were all one. Which Assertion I endeavour to Evince by the following Arguments.

(1.) On this *Hypothesis* the Letter of *Moses* is as exactly followed as in the contrary one. 'Tis agreed that *Moses* calls the several Revolutions of the Sun, in which the Creation was Perfected, *Days*, every where in that History. Now as a *Year* is properly the succession of the four several Seasons, Spring, Summer, Autumn and Winter, arising from *one single* Revolution of the Earth about the Sun; so a *Day* is the succession of Light and Darkness *once*; or the space of *one single* apparent Revolution of the Sun from any certain Semi-meridian, above or below the Horizon, till its return thither again. Now in the case before us, both these Periods are exactly coincident; and both are perform'd in the same space of time: Which space therefore in equal propriety of speech belongs to either or both those names indifferently; and by consequence, may with the exactest Truth and Propriety be stil'd a

- Day or a Year.* Which thing duly consider'd, if I had no positive evidence for the Proposition before us, yet, setting aside prepossession, I had an equal right and pretence to Truth with the Common Expositors ; I keeping equally close to the Letter of the Sacred History. (2.) This *Hypothesis* gives a rational account of the Scripture stile, wherein a *Day*, even in after Ages, very frequently denotes a *Year* ; as is commonly taken notice of by Expositors. Thus by *Moses* himself the Word *Day* is not only, in the very recapitulation of the Creation, us'd for the intire *Six* ; (*These are the Generations of the Heavens and of the Earth when they were Created, in the Day that the Lord God made the Earth and the Heavens, and every Plant of the Field before it was in the Earth, and every Herb of the Field before it grew.*) But, in other places, as it seems, for the just space of a *Year*. And at the end of *Days*, or after some *Years*, it came to pass, that *Cain* brought of the fruit of the ground an offering unto the Lord. The days of *Adam* after he had begotten *Seth* were eight hundred years. And all the days that *Adam* lived were nine hundred and thirty years, and he died. And so of the rest of the Genealogies in that Chapter. Thus in others of the Holy Writers, I will give thee ten shekels of Silver by the days, i. e. per annos, by the years, or every year. Thus what in one place is, *Jeshuab* waxed Old, and came into Days ; is in another, *Jeshuab* was old, and stricken in years. The like phrases we have of *David* ; the number of Days that *David* was King in *Hebron*, over the house of *Judah*, was seven Years and six months. The Days that *David* reigned over *Israel* were forty years. So, what was in the Law, Bring your Tyths after three Years ; is in the Prophet, Bring your Tyths after three Days. Which ways of speaking, with others that follow, may
- Gen ii.
4. 5.
- Cap. iv. 3.
- Cap. v. 4. 5.
- Jud. xvii.
10.
- Josh. xiii.
1.
- Cap. xxiii.
1.
- 2 Sam. ii.
11.
- 1 King. ii.
11.
- Deut. xiv.
28.
- Amos iv.
4.

may seem alluded to, and explain'd by these two, tho' themselves somewhat of a different nature.

Your children, says God to the Israelites, shall wander in the Wilderness forty Years; after the number of the Days in which ye searched the land, even forty Days, each Day for a Year, shall you bear your iniquities, even forty Years. Lye thou, says God to the Prophet Ezekiel, on thy left side, and lay the iniquity of the house of Israel upon it; according to the number of the Days that thou shalt lye upon it, thou shalt bear their iniquity: For I have laid upon thee the Years of their iniquity, according to the Number of the Days, three hundred and ninety Days; so shalt thou bear the iniquity of the house of Israel. And when thou hast accomplish'd 'em, lye again on thy right side; and thou shalt bear the iniquity of the house of Judah forty Days; I have appointed thee a Day for a Year. But what I mainly and principally intend here is, that known, frequent and solemn way in the Prophetick Writings of determining Years by Days; the instances of which are very obvious, some whereof I shall here barely quote for the Reader's satisfaction; (and more in a case so notorious and remarkable need not be done.) How long shall be the vision concerning the daily sacrifice, and the transgression of desolation, to give both the Sanctuary and the Host to be trodden under foot? And he said unto me, Unto two thousand three hundred Days; then shall the Sanctuary be cleansed. From the time that the daily sacrifice shall be taken away, and the abomination that maketh desolate be set up, there shall be one thousand two hundred and ninety Days. Blessed is he that waiteth, and cometh to the one thousand three hundred five and thirty days. But go thou thy way till the end be; for thou shalt rest, and stand in thy Lot at the end of the days. I will give power unto my two witnesses, and

Num. xiv.
33, 34

Ezek. iv.
4, 5, 6.

Dan. viii.
13, 14.

Cap. xii.
11, 12, 13.

Apoc. xi.
they 3.

Cap. xii. 6.

Dan. ix.
24, 25, 26.Apoc. xi.
2.
Cap. xiii.
5.

they shall prophecy one thousand two hundred and sixty days, cloathed in sack-cloth. The Woman fled into the Wilderness, where she hath a place prepared her of God, that they should feed her there, one thousand two hundred and sixty days. Agreeably whereto a Week consisting of seven days, denotes seven years; and a Month, consisting of thirty days, denotes thirty years, in the same Prophetick Writings. Thus in that most famous of all Prophecies, concerning the death of the Messiah. *Seventy Weeks* are determin'd upon thy people, and upon thy holy city; to finish the transgression, and to make an end of sins, and to make reconciliation for iniquity, and to bring in everlasting righteousness, and to seal up the vision and prophecy, and to anoint the most Holy. Know therefore and understand, that from the going forth of the commandment to restore and to build Jerusalem, unto the Messiah the Prince, shall be seven weeks, and sixty and two weeks; the street shall be built again, and the wall, even in a straight of times. And after the sixty and two weeks shall Messiah be cut off: but not for himself. The Ho.^y City shall they tread underfoot forty and two months. Power was given to the Beast to continue forty and two months. All which expressions, with others of the same nature, are not accountable; I mean there is no satisfactory reason can be given why a Day should so frequently denote a Year in the Sacred Writings, on any other Hypothesis. We usually indeed content our selves in these cases with the bare knowing the meaning of Scripture expressions, as if they were chosen at a venture; and so, for instance, finding a Day to represent a Year in the same Books, we rest satisfi'd, without enquiring why a Day rather than an Hour, a Week, or Month, (the two latter of which terms are yet us'd by these Authors) were pitch'd upon to signifie the before-mention'd space to us;

or

or why if the word *Day* must be made use of, it must mean a determinate just *Year*, rather than a *Week*, a *Month* or a *Thousand Years*, (for which last it yet seems sometimes to be taken) so frequently in the Sacred, especially the Prophetick Writings. But 'tis very supposable, that 'tis our Ignorance or Unskilfulness in the Stile of Scripture, and those things therein deliver'd (not the Inaccuracy of the Writers themselves) which occasions our so laxe and general Interpretations. It will sure at least be allow'd me, that wherever not only the Meaning of Phrases, but the Original and Foundation of such their Meaning is naturally and easily assignable, an account thereof is readily to be embrac'd. And certainly the Primitive *Years* of the World being once suppos'd to have been *Days* also; and call'd by that name in the History of the Creation; this matter will be very easie; the succeeding Stile of Scripture will appear only a continuation of the Primitive, and fitted to hint to us a time wherein a *Day* and a *Year* were really the same: And this without any diminution of the true designs of the Prophetick numbers; I mean the involving their Predictions in so much, and no more obscurity, as might conceal their meaning till their completion, or till such time at least as the Divine Wisdom thought most proper for their manifestation in succeeding Ages. So that this Argument demonstrates the present Exposition to afford a natural foundation of accounting for such ways of speaking in the Holy Scriptures, which otherwise are, as to their Occasion and Original, unaccountable; and consequently, proves it to be as truly agreeable to the *Stile*, as the former did to the Letter thereof. (3.) The six *Days* of Creation, and the seventh of Rest,

Ps. xc. 4.
2 Pet. iii. 8.
Gen. ii. 17.

Gen. ii. 1,
2, 3.

were, by Divine Command, to be in after Ages commemorated by *Years* as well as by *Days*; and so in reason answered alike to both those denominations. 'Tis evident, that the Works of the Creation were compleated in six *Evenings* and *Mornings*, or six Revolutions of the Sun, call'd *Days*; and that the seventh was immediately set apart and sanctified as a *Day* of Rest, and Memorial of the Creation just before compleated; and 'tis evident that this Sanctification of the seventh, as well as the operations of the six foregoing, belong'd to the Primitive state of the World, before the Fall. Now that we may know what sort of *Days* these were, 'twill be proper to enquire into the ensuing times; and observe, after the distinction of *Days* and *Years* undoubtedly obtain'd, what constant Revolutions of six for Work, and a seventh for Rest there appear; or in what manner, and by what spaces these Original ones were commemorated; which will go a great way to clear the Point we are upon. And here, 'tis evident, that when God gave Laws to the *Israelites*, he allow'd them six ordinary *Days* of Work, and ordain'd the seventh for a *Day* of Rest or Sabbath, in Imitation and Memory of His Working the first six, and Resting or keeping a Sabbath on the Seventh *Day*, at the Creation of the World. This the Fourth Commandment so expressly asserts, that 'tis past possibility of question. 'Tis moreover, evident that God, upon the Children of *Israels* coming into the Land of *Canaan*, ordained (with reference, as 'tis reasonable to suppose, to the same Primitive State of the World, the six Days of Creation and the Sabbath) That six *Years* they should Sow their Fields, and six *Years* they should Prune their Vineyard, and gather in the Fruits thereof;

But

Lev. xxv.
3, 4.

But in the seventh *Year* should be a Sabbath of Rest unto the Land, a Sabbath for the Lord: They were neither to Sow their Field, nor Prune their Vineyard: Then was the Land to keep a Sabbath unto the Lord. So that if we can justly presume that the primary spaces of the World, here refer'd to, were proper *Evenings* and *Mornings*, or Natural *Days*, because they were represented and commemorated by six Proper and Natural *Days* of Work, and the seventh of Rest: I think 'tis not unreasonable to conclude they were Proper and Natural *Years* also; considering they appear to have been among the same People, by the same Divine Appointment, represented and commemorated by these six Proper and Natural *Years* of Work, and the seventh of Rest also. Nay, if there be any advantage on the side of Natural *Days*, from the expressness of the reference they had to the Primitive ones (which the Fourth Commandment forces us to acknowledge) there will appear in what follows somewhat that may justly be esteem'd favourable on the side of *Years*. Besides the six *Days* for Work, and the seventh for Rest, the *Jews* were commanded (on the same account, as we may justly suppose) to number from the Passover seven times seven *Days*, or seven Weeks of *Days*, and at the conclusion of them to observe a solemn Feast, call'd the Feast of Weeks or of Sabbaths, once every year. In like manner besides the *Yearly* Sabbath as I may call it, or the seventh *Year* of Rest and Release after the six *Years* of Work, the *Jews* were commanded (on the same account, as we may justly suppose) to number seven Sabbaths of *Years*, seven times seven *Years*; and at the conclusion thereof to celebrate the great Sabbatical *Year*, the *Year* of *Jubilee*: They

ver. 1.
Vid. Deut.
xv.

Lev. xxiii.
15-21.

Cap. xxv.
8-16.

were neither to Sow, nor Reap, nor Gather in the Grapes, but esteem it Holy, and suffer every one to return to his Possession again. Where that which is remarkable is this, that when the Sabbatical *Days*, and Sabbatical *Years* equally return'd by perpetual revolutions immediately succeeding one another; yet the case was not the same as to the Feast of Weeks at the end of seven times seven *Days*; that following the Passover, and not returning till the next Passover again, and so was but once a Year: Whereas its corresponding Solemnities, the *Jubilees*, or great Sabbatical *Years*, at the end of seven times seven *Years*, did, as the former, return by perpetual revolutions immediately succeeding one another for all future Generations. All which duely consider'd, I think upon the whole, 'tis but reasonable to conclude, That seeing the Primitive spaces, or periods of Work and Rest, appear, by Divine Appointment, to have been commemorated among the *Jews* by *Years* as well as by *Days*; the same Primitive spaces or periods were equally *Days* and *Years* also. (4.) The Works of the Creation, by the Sacred History, concurring with Ancient Tradition, appear to have been leisurely, regular, and gradual, without any precipitancy or acceleration by a Miraculous hand on every occasion: Which is impossible to be suppos'd in those *Days* of twenty four short hours only; but if they were as long as the present *Hypothesis* supposes, they were truly agreeable and proportionable to the same productions. Which consequence will be so easily allow'd me, that I may venture to say, That as certain as is the regular and gentle, the natural and leisurely procedure of the Works of the Creation (of which I know

know no good Reason from any Warrant sacred or prophane to make any question) so certain is the Proposition we are now upon, or so certainly the Primitive *Days* and *Years* were all one. (5.) Two such Works are by *Moses* ascrib'd to the third *Day*, which (if that were not longer than one of ours now) are inconceivable and incompatible. On the former part of this *Day* Gen. i. the Waters of the Globe were to be drain'd off 9—13. all the dry Lands into the Seas; and on the same *Day* afterward, all the Plants and Vegetables were to spring out of the Earth. Now the Velocity of running Waters is not so great, as in a part of one of our short *Days*, to descend from the middle Regions of the dry Land into the Seas adjoining to them; nor if it were, could the Land be dry enough in an instant for the Production of all those Plants and Vegetables, which yet we are assur'd appear'd the same *Day* upon the face of it; which Difficulties vanish, if we allow the primitive *Days* to have been *Years* also, as will more fully be made appear in due place. (6.) Whatever might possibly be said of the other *Days* works, by recurring to the Divine miraculous Power; (which yet is here not only unnecessarily, and without warrant from the Sacred History it self, but sometimes very indecently done) yet the numerous Works ascrib'd to the sixth *Day* plainly shew, That a space much longer than we now call a *Day*, must have been referr'd to in the Sacred History. The business of the sixth *Day* includes evidently these following particulars. (1.) The Production of all the bruit dry-land Animals. (2.) The Consultation about, and the actual Creation of the Body, and Infusion of the Soul of *Adam*. Gen. i. & ii. (3.) The Charter or Donation of Dominion over all Creatures bestow'd on *Adam*. (4.) The

(4.) The Exercise of Part of that Dominion, or the giving Names to all the dry-land Animals; which sure suppos'd some acquir'd knowledge in *Adam*, some Consideration of the Nature of each Species, some skill in Language, and the use of Words; andwithal, some proportionable Time for the gathering so great a number of Creatures together, and for the distinct naming of every one. (5.) When on this review it appear'd, that among all these Creatures there was not a Meet-help, or suitable Companion for him; God then cast him into a deep Sleep, (which 'tis probable lasted more than a few minutes to deserve that Appellation) took out one of his Ribs, closed up the Flesh instead thereof, and out of that Rib made the Woman. (6.) After this God brings this Woman to *Adam*, he owns her Original, gives her an agreeable Name, takes her to Wife, and they together receive that Benediction, Increase and Multiply. (7.) God appoints them and their Fellow-Animals, the Vegetables for Food and Sustenance. All which (to omit the *Jews* Tradition of the Fall of Man this sixth *Day*, and such things presuppos'd thereto which must belong to it, even by the *Mosaick* History it self) put together, is vastly more than is conceivable in the short space of one single *Day* in the vulgar Sense of it. 'Tis true, God Almighty can do all things in what portions of Time he pleases. But 'tis also true, (as Bishop *Patrick* well observes in a like case) that Man cannot. He must have time allotted him, in proportion to the business to be done, or else 'tis not to be expected of him. And 'tis plain, That *Adam* and *Eve* were mainly concern'd in the latter Actions of this *Day*: so that by a just and necessary consequence, That *Day* in

Vid Bishop
Patrick on
Gen. in
Initio.
Gen. ii. 4,
&c.

On Gen. 3.
init.

in which *they* went through so many and different Scenes, and perform'd so many Actions, requiring at least no small part of a *Year*; and that after themselves and all the dry-land Animals had been on the same *Day*, produc'd, was certainly such a *Day* as might be proportionate to such Operations, and not shorter than a *Year*, which the present *Hypothesis* allows in the case. (7.) If the History of the Fall of Man be either included in the sixth *Day*, according to the Ancient Tradition of the *Jews*, which I confess to be very improbable; or belong to the seventh, as might, by coming as near as possible to such old Tradition, more probably be allow'd: On either of these Suppositions, there is the greatest necessity imaginable of supposing such a *Day* much longer than is commonly done. Which I think is of it self so plain, that I need not aggravate the matter, but leave it to the free Consideration of the *Reader*. All which Arguments to me appear very satisfactory, and evince, that the first distinguishing and peculiar Character of such a primitive State of Nature as was before-mention'd did really belong to our Earth before the Fall, and that then a *Day* and a *Year* were exactly one and the same space of Time.

(2.) In the primitive State of the World the *Sun* and *Planets* rose in the *West*, and set in the *East*, contrary to what they have done ever since. This may seem to have been the foundation of that Story in *Herodotus*, who tells us, That the *Sun*, in the space of 10340 Years, four times inverted his Course, and rose in the *West*. But what I mainly depend on, is that Discourse in *Plato*, who relating some very ancient Traditions about the primitive State of things, and

Lib. 2.

cap. 142.

Archæol. p.

250, 251,

252.

what

what a mighty and remarkable Change was effected by a certain mighty and remarkable Alteration in the Heavenly Motions, (which Alteration in general deserves also to be taken notice of, as agreeing so well with the present *Hypothesis*) the most surprizing, and of the greatest consequence of all others, and the cause of suitably surprizing and considerable Effects in the present State of Nature, makes it to be this change of the Way or Course of the Heavenly Bodies, which is the consequence of the present Assertion. For this grand thing of which he had spoken so highly, is this, Ἐστὶ δὲ ἢ διὰ τούτου αὐτοῦ, ἢ διὰ πάντων ποιεῖν, τὸν μὲν, ἐφ' ᾧ νῦν κινεῖται, εἰπὼν, τὸν δ' ἐν τ' ἀντιθέτῳ. *The Motion of the Universe sometimes revolves the same way that it does now, and sometimes the contrary way.* Which Testimony is very plain, and full to our present purpose.

(3.) In the primitive State of Nature there was a perpetual *Equinox*, or Equality of Day and Night through the World. This *Phænomenon*, or such Effects as in part suppose it, is usually by the Christian Fathers applied to the *Paradisiacal* State; and by the Ancient Heathens to the *Golden Age*, or the Reign of *Saturn*: (coincident, 'tis probable, at least in part, thereto) For they all with one consent deny that the *Sun's* Course was oblique from one Tropick to another, or that the difference and inequality of Seasons, which must have followed therefrom, did belong to that first and most happy State of the World, as may at large be seen the places quoted in the Margin, too long here to Transcribe; to which therefore I refer the *Reader*, and proceed.

Theor. lib.
2. cap. 1.
& 10. *Astr.*
chaol. lib.
2. cap. 5.
& 6.

(4.) In

(4.) In the primitive State of the World, there was no Equator distinct from the Ecliptick; all Motions were perform'd about one invariable *Axis*, that of the latter; (for the Plains of the Planet's Orbits, I consider as nearly coincident with that of the Ecliptick) without the Obliquity of one Circle or Motion to another. Tho' this be somewhat related to the former particular, yet I shall distinctly quote a Testimony or two directly belonging hereto, and not so properly reducible to the other. The first is that of *Anaxagoras*, who says, Τα δ' ἀστὲρ τὰ ἀρχαῖα μὲν δολοσιδὸς ἐνὶ χθύνῃ, ὥστε καὶ κορυφὴν τὴν γῆς τὴν αὐτὴν εὐμαρὸν ἵδ' ὅλον. That the Stars in their primitive State revolv'd in a Tboliform manner, insomuch, that the Pole appear'd perpetually at the Vertex of the Earth. Whose meaning, tho' somewhat obscure, seems to be, That the Motion of the Heavens was originally about one Center or *Axis*, that of the Ecliptick, whose Pole was continually over against the same Point of the Earth; which on the *Hypothesis* before us is true, but in the present Frame of Nature impossible. The next Author, whom I shall produce, is *Plato*, who in the foremention'd Discourse about the Ancient and Modern States of the World, says, That in the former of them the Motion of the Heavens was uniform, which thing was the cause and original of the Golden Age, and of all that happiness which therein Mankind enjoy'd, or external Nature partook of; which, how well it suits the present *Hypothesis*, I need not say. All that exceeding happy State of Nature, which innocent Man enjoy'd, beyond what he does since the Fall, being therein owing to such a Constitution of the World as this Author intimates, and I am now proving. Which in the last place, shall be

Theor. lib.
2. cap. 10.
p. 293.

Archæol.
p. 251.

Ibid. p.
273.

be confirm'd from *Baptista Mantuanus*, who says, (relating the Opinion of the old Astronomers) All the Cœlestial Spheres were in the beginning of the World concentrical and uniform in their Motion; and the *Zodiack* of the *Primum Mobile*, and that of the Planets (the Equator and Ecliptick) were united and coincident, by which means all sublunary Bodies were more vivid and vigorous at that time than in the present Ages of the World; as the *Theorist* sums up the force of his Testimony, very agreeably to the *Hypothesis* before us, of the Astronomy in the primitive State of the Heavens.

Hypothesis 4.
infra.

(5.) To the first Inhabitants of the Earth, (dwelling at the Interfection of the ancient Ecliptick with the present *Northern* Tropick; of which hereafter) the Poles of the World were neither elevated nor depress'd, but at the Horizon. But sometime after the Formation of things, they suddenly chang'd their Situation; the *Northern* Pole appear'd to be elevated above, and the *Southern* depress'd below the Horizon; and the Course of the Heavens seem'd bent or inclin'd to the *Southern* Parts of the World; or in plain words, there was a new Diurnal Rotation began about the present *Axis* of the Earth; which I take to be the true and easy Exposition of the same *Phænomena*. This Matter is much insisted on by the Ancients, and being so, will fully confirm our Assertion, and give light and strength to some of the former Testimonies.

Theor. lib.
2. cap. 10.

Plutarch has a Chapter entituled, Περὶ Ἐγκλίσεως ᾠῆς, Of the Inclination of the Earth; in which he thus recites the Opinion of *Leucippus*, Παρεκπεσὶν τὸ γῆν εἰς τὰ μεσημβρινὰ μέρη, διὰ τὴν ἐν ταῖς μεσημβρινοῖς ἀσπίοτητα, ὅτε δὲ παλαιότερον ἦν βορείων διὰ τὴν κατὰ φύσιν τῆς ἀρούρης, ἥν δ' ἀντιθέτων πνευμάτων.

ὁμοίῳ. That the Earth fell, or was inclin'd towards
 the Southern Regions, by reason of the rareness of
 those Parts; The Northern Regions being grown
 rigid and compact, while the Southern were scorcht
 or on fire. Whose Opinion is also recited by La-
 certius in almost the same words, Ἐκείπεν ἡ ἥλιος
 καὶ σπλήνῳ τὸ κακίον τὴν γῆν πρὸς μισμύειαν, τὰ δὲ
 πρὸς ἀρκτον αἰετὶ νίβει, καὶ κατὰ ψυχρὰ ἵη, καὶ πύγνυζ.
 By reason of the failure in the Sun and Moon, the
 Earth was bent or inclin'd towards the South. But
 the Northern Regions grew rigid and inflexible by
 the snowy and cold Weather which ensued thereon.
 To the same purpose is the Opinion of Democri-
 tus, Διὰ τὸ ἀδυνάτεον ἡ τὸ μισμύειον ἢ ἀέριον,
 αὐξομένην τὴν γῆν καὶ ὅτε ἐγκλιθῆναι: τὰ δὲ βόρεια
 ἀκρεατα, τὰ δὲ μισμύεινα χύματα, ὅθεν καὶ ὅτε βεβάρη
 ὅτε περιστῇ ὅτε πῖς κατὰ τὴν αὐξήσιν. That by
 reason of the Southern Ambient Air's imbecillity, or
 smaller Pressure, the Earth in those Parts increas'd in
 bulk, and so sunk and bent that way. For the Nor-
 thern Regions were ill temper'd, but the Southern
 very well; whereby the latter becoming fruitful, wax-
 ed greater, and by an over-weight preponderated and
 inclin'd the whole that way. As expresse to the full
 is the Testimony of Empedocles, Τὸ αἶρ' οὐκ ἔστι
 τῇ τῇ ἡλίου ὀρεμῇ, ἐγκλιθῆναι πρὸς ἀρκτας, καὶ τὰ μὲν βό-
 ρεια ὑψοῦσθαι, τὰ δὲ νότια κατακλιθῆναι, καὶ ὅτε καὶ
 ὅλον κόσμον. The North, by reason of the air's yield-
 ing to the Sun's force, was bent from its former Posi-
 tion; whereupon the Northern Regions were elevated,
 and the Southern depress'd, as together with them,
 was the whole World. To which agrees Anaxago-
 ras in these words, which immediately follow
 those just before quoted, Ὅτι καὶ τὸ πᾶν τὴν ἐκκλι-
 σιν λαβεῖν. But afterward the Pole receiv'd a turn
 or inclination. These so many, and so preg-
 nant Testimonies of Antiquity, as to the matters
 of

of fact foregoing, (for as to the several Reasons assign'd by them, they being, I suppose, but the single Conjectures of the Authors, must be uncertain, and need not be farther consider'd or insisted on in the present case) seem to me so weighty, that I cannot but build and rely very much upon them. How should such strange and surprizing *Paradoxes* run so universally through the eldest Antiquity, if there were not some ground or foundation in earnest for them? 'Twould be hard wholly to reject what were so unanimously vouch'd by the old Sages of Learning and Philosophy, even tho' there were no other evidence or reason for our belief. But when all these Authors, *the only competent Witnesses in the Case*, do but confirm what on other Accounts, as we have seen, and shall farther see, there is so good reason to believe; and when so great light is thereby afforded to the primitive Constitution of Nature, and the Sacred History of the State of Innocency; their Attestations are the more credible, and the more valuable, and in the highest degree worthy of our serious Consideration. What I can foresee of Objection, deserving our notice, against what has been advanc'd from the Testimonies of the old Philosophers, is this, That they seem to favour the perpetual *Equinox* before the Flood, by the right Position of the present *Axis* of the Earth, parallel to that of the *Ecliptick*, (as the *Theorist* imagines) and its Inclination or oblique Position acquir'd at the Deluge, (as the same Author supposes) rather than the original Absence, and subsequent commencing of the Diurnal Rotation after the Fall of Man, as I here apply them. I answer, (1.) The Parallelism of the *Axis* of a Diurnal, to that of an Annual Revolution,

volution, is as far as I find, a perfect stranger to the System of the World; there being, I think, not one of the Heavenly Bodies, *Sun* or *Planet*, but has its own *Axis* oblique to the Orbit in which it moves. (2.) It will be farther evinc'd hereafter, That, *de facto*, before the Flood, the *Axis* of the Earth was Oblique to its Annual Orbit, the Plain of the Ecliptick; and the Year distinguish'd into the present Seasons, *Spring*, *Summer*, *Autumn*, and *Winter*. (3.) That equable and healthful Temper of the Air, which the *Theorist* chiefly relied upon, as necessary to the Longevity of the Antediluvians, and fully prov'd by Antiquity, shall be accounted for without such an *Hypothesis*. (4.) The Testimonies before alledg'd do not, if rightly consider'd, suit this *Hypothesis*; nay, in truth, they fully confute it. Of the five Characters before-mention'd, under which we have reduc'd the main Testimonies, there are two which are common to this, and to the *Theorist's Hypothesis*, viz. (1.) The perpetual and universal Equinox. (2.) The coincidence of the Equator and Ecliptick (tho' in somewhat a different manner). So that the Testimonies for these two can neither establish the one, nor the other, as equally suiting them both. The other three are peculiar to that *Hypothesis* we have been proving, and by consequence at the same time establish that, and confute the *Theorist's Hypothesis*. And these three are, (1.) The Equality of a *Day* and a *Year*. (2.) The *Sun* and *Planet's* rising in the *West*, and setting in the *East*. (3.) The Position of the Poles at the Horizon, with the after Elevation of the *Northern*, the Depression of the *Southern* Pole, and the inclination or bending of the Heavenly Bodies Courses towards the *South*. 'Tis evident at first view, That the

Phænomen.
32. *infra.*

two former of these three last mention'd *Phænomena*, are inconsistent with the *Theorist's Hypothesis*, and on a little Consideration 'twill be so of the last also. For while the Poles of the Earth or World remain in being the same, as depending on the same proper *Axis* of the Earth's own Diurnal Revolution; 'tis plain, the Latitude of Places on the Earth, or the Elevation of the Pole equal thereto, remains invariable; and so that Pole which to the Inhabitants of Paradise was elevated at the least $23\frac{1}{2}$ degrees, could not be at the Horizon, whatever right Position the *Axis* of the Earth might have with respect to the Ecliptick. On the same account there could, even in the *Theorist's* own *Hypothesis*, be no new Elevation of the one, or Depression of the other Pole at the Deluge, nor inclination of the Courses of the *Sun* and *Planets* towards the *South*. All that could on the *Theorist's* Principles be effected, (besides the Earth's Equator and Poles pointing to different fix'd Stars, and its Consequences) was only this; that whereas before the *Sun* was always in the Equator, or middle distance from any Climate, it afterwards by turns came nearer to them (as we commonly, tho' carelessly express it) in *Summer*, and went farther from them in *Winter*, than before; which upon the whole, was no more a bent or inclination to one part of the Heavens than to the other; and so of the *Planets* also. And the case is the same as to the Poles of the Ecliptick; the *Northern* one being as much elevated above that of the World at one hour of the Day, as depress'd beneath it at another. All which is, I think, sufficient to shew, That the Testimonies of Antiquity allerdg'd by the *Theorist* for the perpetual *Equinox*, or the right Position of the Earth's *Axis* till

till the Deluge, and the oblique Position, and different Seasons then acquir'd, are sufficient of themselves alone to confute *his*, and establish the *present Hypothesis*. (5.) All things consider'd, such a Position as the *Theorist* contends for, was more likely to incommode, than be useful to Mankind. Taking the Matter wholly as the *Theorist* puts it, it would prevent the Peopling of the *Southern Hemisphere*, by the scorching heat just under the Equator, without the least Intermission at any time of the Year. It would render the Earth utterly unserviceable, both under the Equator and Poles, and in the *Climates* adjoining, and so streighten the Capacity of the Earth in maintaining its numerous Inhabitants; which, were the whole inhabitable, will appear but just sufficient to contain them. It would by the Perpetuation of one and the same Season continually, hinder the variety of Fruits and Vegetables of every Country; and many other ways spoil the settled Course of Nature, and be pernicious to Mankind. (6.) No mechanical and rational Cause of the Mutation of the Earth's *Axis* either has been, or, I believe, can be assign'd on the *Theorist's Hypothesis*, or any others which should embrace the same Conclusion.

(7.) Lastly, to name no more Arguments, The Testimonies of *Diogenes* and *Anaxagoras*, are as express almost to the Time, as to this Change it self. The words being exceeding remarkable, are these, as *Plutarch* himself relates them, *Διογένης* καὶ *Ἀναξαγόρας* μετὰ τὸ συλῶαι τὸν κόσμον, καὶ τὰ ζῷα ἐκ τῆς γῆς ἐξασφείν, ἐκκληιδέναι πῶς τὸν κόσμον ἐκ τῶν στοιχείων εἰς τὸ μισθικεῖν αὐτὸν μέθ'· ἵσως καὶ σφύρας, ἵνα αὐτὸν πάλιν ἀσκήσῃ, καὶ τὸν κόσμον ἐκ τῶν στοιχείων, καὶ ἐκ πύρων, καὶ ἐκ νεφελῶν. *Thus the Doctrine both of Diogenes and Anaxagoras,*

Vid. *Phænom.* 33. *infra.*

Vid. *Bentley, Sermon.* 8. p. 22, &c. And *Dr. Woodward's Essay*, p. 267. &c.

Theor. lib. 2. csp. 10.

That after the Creation or primary Constitution of the World, and the Production of Animals out of the Earth, the World, as it were of its own accord, was bent or inclin'd towards the South. And truly 'tis probable this Inclination was the Effect of Providence, on purpose that some Parts of the World might become habitable, and others uninhabitable, by reason of the difference of the frigid, torrid, and temperate Climates thereof. Which observable and most valuable Fragment of Antiquity ought to have been before mention'd, but was on purpose reserv'd for this place; where it not only fully attests the matter of fact, the Inclination of the Heavens towards the South; not only assigns the final Cause truly enough, (considering the uninhabiteness of the Torrid, as well as of the Frigid Zones, in the Opinion of those Ages) the Distribution of the Earth into certain and fix'd Zones, Torrid, Temperate, and Frigid; but so accurately and nicely specifies the time also, That succeeding the Creation, agreeably to the present *Hypothesis*; that were I to wish or chuse for a Testimony fully to my mind, I could scarcely have desir'd or pitch'd upon a better. To these five foregoing Arguments, for the proof of my main Conclusion, I shall, by way of supernumerary ones, or Appendages, add one or two more, and so leave the whole to the Consideration of the Impartial Reader.

(6.) The State of Mankind without question, and perhaps that of other Animals, was before the Fall vastly different from the present; and consequently requir'd a proportionably different State of external Nature; of which, without the *Hypothesis* before us, no Account can be given, or at least has not yet by any been attempted. The World, as to other things, seems to have been

been at first, in great measure, put into the same Condition which we still enjoy; and yet Reason, as well as Scripture, assures us, That so different a condition of things in the Animal, Rational and Moral, must be suited with an agreeably different one in the Natural and Corporeal World. Which being consider'd, and that at the same time no remarkable difference has been, or perhaps can be assign'd, but what the *Hypothesis* before us, and its consequences afford us; and that withal a satisfactory account of the several Particulars is deducible from the same, as I hope to make appear hereafter; upon the whole, I think this a very considerable Attestation to what has been before insisted on. 'Tis indeed possible, that what I look on as an advantage to, others may imagine to be a prejudice against the present *Hypothesis*; as inferring, among other things, a half year of Night, as well as a half year of Day, which may be suppos'd too disproportionate to the State and Condition of Mankind; and especially, too inconvenient for so happy and easy a Life, as that of Mankind in Paradise undoubtedly was, without any consideration of the other Creatures. But it ought to be consider'd, as has been already remark'd, that our judging of one Scheme or System of Nature by another, is very fallacious, and very unreasonable. Almighty God adapts each particular State to such rational and animal Beings as are on purpose design'd for the same; but by no means thereby confines his Power and Providence, which can with the same ease adapt other Beings, or the same in other Circumstances, to a very different and clean contrary Condition: The Days in *Jupiter* are not ten hours long; those in the *Moon* near Seventy two

Coroll. 3. &
4. Lem. 70.
prior.

times as long as they, or a Month; yet any one who should thence conclude, that either *Jupiter* or the *Moon*, if not both, were incapable of Inhabitants, he would, I think, be very rash, not to say presumptuous, in so doing. 'Tis true, he might justly conclude, That such Creatures as dwell on this *Earth* in their present Circumstances could not, or at least could not with convenience, inhabit either of them. But the necessary consequence of that is only this, That as the State of external Nature appears to be in *Jupiter* and the *Moon*, very different from ours on *Earth* now; so most probably are the State and Circumstances, the Capacities and Operations of their several Inhabitants equally different from those of Mankind at present upon it; which is what I fully allow, and plead for, in the Case before us; and which, when rightly consider'd, may save me the labour of returning any other Answer to the particular difficulty here mention'd, and of enlarging upon several other things which might be said to great satisfaction on the present occasion; which in prospect thereof, shall therefore be no further prosecuted in this place.

(7.) Lastly, The present *Hypothesis* gives an easy Account of the vast change in the Natural, on the change in the Moral World; and of the sad Effects of the Divine Malediction upon the Earth after the Fall of Man; which till now has not, that I know of, been so much as attempted by any. Several have been endeavouring to account for that change which the Deluge made in the World: But they are silent as to the natural causes or occasions of a Change, which (Antiquity, Sacred or Profane, being judge) was in all respects vastly more remarkable: The State of Innocency,

discovery of these things has afforded my self, and I am sure that my Labours will not be in vain.

IV. The ancient Paradise or Garden of *Eden*, the Seat of our first Parents in the State of Innocence, was at the joynt Course of the Rivers *Tigris* and *Euphrates*; either before they fall into the *Persian Gulf*, where they now unite together, and separate again; or rather where they anciently divided themselves below the Island *Ormus*, where the *Persian Gulf*, under the Tropick of *Cancer*, falls into the *Persian-Sea*.

That somewhere hereabouts, on the Southern Regions of *Mesopotamia*, between *Arabia* and *Persia*, was the place of the ancient Paradise, 'tis past reasonable doubt from two of its Rivers, *Tigris* and *Euphrates*, occuring in the Description of its Situation by *Moses*. And when the following Theory is understood, perhaps there will appear reason to alter the place, where more nicely it may be supposed to have been, to that other here conjectur'd. I say, *When the following Theory is understood*; for tho' the particular place assign'd be now under Water, and a Branch or Bay of the great Ocean; yet in probability it might not be so then, as will hereafter appear. My reasons for this Situation of Paradise, are these,

(1.) The

Gen. ii.

14.

(1.) The Ancient Tradition of the *Jews* and *Arabians* was, that Paradise was seated under the Primitive Equinoctial; which is impossible, unless it were as far South as the Tropick of *Cancer*: Under which therefore it ought to be, and accordingly is by this *Hypothesis* plac'd and determin'd. *Archæol. p. 269.*

(2.) 'Twill be easie on this *Hypothesis* for every one to suppose that the other two Rivers, or Branches of these, *Pison* and *Gibon*, which have been in vain hitherto sought for, must be now lost in the *Persian* Sea; and therefore not to be discover'd, nor their discovery to be expected, since the Deluge.

(3.) The Countries encompass'd by, and bordering on, these four Streams or Rivers, being alike, in part, under Water; the difficulties arising from the common mistaken Suppositions relating thereto will cease, and Light be afforded to the *Mosaic* Description on the particular consideration thereof.

(4.) The most literal and obvious sense of the Words of the Sacred Historian concerning the situation of *Eden*, and its Garden or *Paradise*, will be accountable, and exactly suitable to the state of these Countries, according to the present Geography. The words of *Moses* are, *And the Lord God planted a Garden eastward in Eden; and there he put the man whom he had formed. And a River went out of Eden to water the garden; and from thence it was parted and became into four heads.* *Gen. ii. 8, 10.* To which the present *Hypothesis* is correspondent to the greatest niceness, if we suppose that *Tigris* and *Euphrates* being united, as they are now, in *Babylonia*, ran in one Stream quite through that Valley, which is now cover'd with Water, and call'd

call'd the Gulf of *Persia* (I suppose the Country of *Eden* then) upon the Exit of which, beyond *Ormus*, the said United Streams divided themselves (as *Nile* into seven) into four separate branches; and by them, as by four Mouths, discharged it self into the *Persian* Sea: Two of which Streams retain'd the Names of the Original ones, *Tigris* and *Euphrates*; and the other two acquir'd new ones, and were call'd *Pijon* and *Gibon*; just before or about which Division, that Country stil'd *Paradise*, or the *Garden of Eden* was, I imagine, accordingly situate. This I take to be the most probable account of this Point; and such an one as takes away the perplexities of this matter; agrees to the Letter of *Moses*, and the Geography of the Country; and is suitable withal both to what the *Jewish* and *Arabian* Tradition before-mention'd assert, and what the next *Hypothesis* requires.

V. The Primitive Ecliptick, or its correspondent Circle on the Earth, intersected the Present Tropick of *Cancer* at *Paradise*; or at least at its Meridian.

When from the last *Hypothesis* but one, it appears that the Primitive Ecliptick was a fixed Circle on the Earth, as well as in the Heavens; and must both equally divide the present Equator, and touch the present Tropicks; 'tis proper to fix, if possible, the Point of Intersection with the Northern Tropick; whereby the intire Circle may be still describ'd, and its Original Situation determin'd. Which is the attempt of this

this *Hypothesis* we are now upon ; and which I thus prove.

(1.) Without this *Hypothesis* the before-mention'd *Jewish* and *Arabian* Tradition, of the situation of Paradise under the Primitive Equinoctial, is unaccountable and impossible to be true. For Paradise being, at the most southern Position supposable, but just under the Tropick of *Cancer*, it could no where be under the ancient Equinoctial or Ecliptick, but at their mutual Intersection ; which must therefore have been as this Proposition asserts.

(2.) The Production of Animals out of the Earth and Waters, at or near Paradise, seems to have requir'd all the heat possible in any part of the Earth ; which being to be found only under the Equinoctial, confirms the last mention'd Argument, and pleads for that situation of Paradise which is here assigned to it.

(3.) And Principally, This situation is determin'd by the coincidence of the Autumnal Equinox, and the beginning of the Night or Sun-set, at the Meridian of Paradise. 'Tis known that at Paradise, or the place of the Creation of Man, the *Νυχθήμερον*, or Natural Day, commenc'd with the Sun-setting, Six a Clock, or coming on of the Night. 'Tis granted also, that the beginning of the most Ancient Year, (which shall presently be prov'd to have been at the Autumnal Equinox) was coincident with the beginning of the World, or of the *Mosaick* Creation. Which things compar'd together, do determine the question we are upon. It being impossible, on the grounds here suppos'd, that Sun-set and the Autumnal Equinox should be coincident to any (but those in the Northern Hemisphere, at the Point) of

Gen. i. 5,
8, 13, 19,
23, 31.

of Interfection of the Ancient Ecliptick, and the present Tropick of *Cancer*; or such as were under the same Meridian with them; as any ordinary Astronomer will soon confess: Which Argument is Decretory, and fixes the place of Paradise to the greatest exactness and satisfaction.

Corollary 1. Hence a plain reason is given, of the Days of Creation commencing at Evening; which otherwise is a little strange: It being but a necessary result of the time of the Year, and Region of the Earth, when, and where the Creation began.

Lev. xxiii.
32.

Coroll. 2. As also why the Jewish Days, especially their Sabbath-Days, began at the same time ever since: The Memory of the Days of Creation being thereby exactly preserv'd.

Coroll. 3. As also why their Civil Years, but especially their Sabbatical Years, and Years of Jubilee, (even after their Months were reckon'd from the Vernal,) began at the Autumnal Equinox: The memory of the Years of the Creation being thereby alike exactly preserv'd.

VI. The Patriarchal, or most ancient Year mention'd in the Scripture, began at the Autumnal Equinox.

Flid. Caisi.
Prolegom.
de tempore
Mundi
Condita
Cap. 34.

The Reasons of this Assertion are these ensuing.

(1.) The principal Head or Beginning of the Jewish Year in all Ages was the first Day of their Autumnal Month *Tiri*; and was accordingly honour'd with an extraordinary Festival, the Feast of Trumpets: When the Head or Beginning of their

Lev. xxiii.
24. 25.
Numb.
xxix. 1---6.

their Sacred Year, the first of *Nisan*, had no such solemnity annex'd to it : As is known and confess'd by all.

(2.) When God commanded the *Jews* on their coming out of *Egypt*, to esteem the Month *Nisan*, the First in their Year; it seems plainly to imply, that till then it had not been so esteemed by them. The words are these. *The Lord spake unto Moses and Aaron in the Land of Egypt, saying, This Month (shall be) unto you the beginning of Months; it (shall be) the first Month of the Year to you.* And this is strengthened by considering, that tho' we here find an Original of the Sacred Year in the Spring; yet we no where do of the Civil in Autumn: Which therefore, 'tis very probable, was the immemorial beginning of the Ancient Year long before the times of *Moses*.

Exod. xii.
1, 2. with
xiii. 4.

(3.) Whatever beginning of the *Jewish* Year there might be on other accounts; 'Tis confess'd by all, That the beginning of the Sabbatical Years, and Years of Jubilee, (by which in all probability the Primary Years of the World were commemorated and preserv'd) was at the Autumnal Equinox: Which is a very good Argument that those Ancient Years, so commemorated and preserv'd, began at the same time also.

(4.) The Feast of Ingathering, or of Tabernacles, which was soon after the Autumnal Equinox, is said to be *in the End*, or *after the Revolution of the Year*: Which is a peculiar confirmation of the Assertion we are now upon.

Exo. xxiii.
16. &
xxxiv. 22.

(5.) Unless that Year at the Deluge commenc'd at the Autumnal Equinox, we must (says the Learned *Lightfoot* in his Scheme thereof) suppose one Miracle more than either Scripture or Reason give us ground to think of; and that is,

that

that the Waters should increase, and lie at their height all the Heat of Summer, and abate and decrease all the cold of Winter. Which, without Reason, he supposes is not to be allow'd.

(6.) What was alledg'd under the last Proposition is here to be consider'd, That on this *Hypothesis* a clear Reason is given of the Nights preceding the Day in the History of the Creation, and ever since among the *Jews*; which otherwise is not so easily to be accounted for.

(7.) The testimony of the *Chaldee Paraphrast*, (to which *Josephus* does fully agree) is as express as possible, upon *1 Kings* 8. 2. where the words are, *In the Month Ethanim, which is the seventh Month*; (*viz.* as all confess, from the Vernal Equinox) upon which the Paraphrase is, *They call'd it of Old the First Month; but now it is the Seventh Month*: Which may well counterpoise all that from some later Authors can be produc'd to the contrary. So that upon the whole I may fairly conclude, notwithstanding some small Objections, (which either lose their force on such Principles as are here laid down, or will on other occasions be taken off) That the most Ancient or Patriarchal Year began at the Autumnal Equinox.

VII. The Original Orbits of the Planets, and particularly of the Earth, before the Deluge, were perfect Circles.

This is in it self so easie and natural an *Hypothesis*, that I might very justly take it for granted, and make it a *Postulatum*: And in case I could prove

prove every thing to agree to, and receive Light from the same, and withal account for the present Eccentricity, no man could fairly charge it with being a precarious or unreasonable one. But although the main reasons for such a Proposition are, I confess, to be taken from the consequences thence to be deriv'd; and the admirable correspondence of them all to Ancient Tradition, to the *Phænomena* of the Deluge, and to the Scripture Accounts thereto relating, as will be visible hereafter; yet there being some Arguments of a different nature which may render it probable, and prepare the Reader for admitting the same, before the consequences thereof come to be fully understood, I chuse to place this Assertion here, among my *Hypotheses*; tho' I do not pretend that the Arguments *here* to be made use of, ought to put the same so near to certainty, as its fellows have, I think, reason to expect with unprejudic'd Readers. But to come to the matter it self: The Reasons I would offer are these following.

(1.) The Designs and Uses of Planets seem most properly to require circular Orbits. Now in order to give a rational guess at the same Designs and Uses of Planets, I know no other way than that from comparison with the Earth. And here, when we find one of the Planets, and that plac'd in the middle among the rest, to agree with the others in every thing of which we have any means of enquiry; 'tis but reasonable to suppose, that it does so also in those, which 'tis impossible for us, by any other certain way, to be assured of. If we observe a certain Engin in one Country, and see to what use 'tis put, and to what end it serves; and if afterward we see another,
tho'

tho' in a different Country, agreeing to the former in all things, as far as we are able to discover : Tho' we are not informed of its design and use, we yet very naturally, and very probably, believe that it serves to the same purpose, and was intended for the same end with the former. Thus it ought sure to be in the case before us ; and by the same way of reasoning we may fairly conclude to what uses all the Planets serve, and on what general designs Providence makes use of them, *viz.* To be the seat or habitation of Animals, and the Seminary of such Plants and Vegetables as are necessary or convenient for their support and sustenance. Which being therefore probably suppos'd of the rest, and certainly known of the Earth, I argue, That a circular Orbit being the most fit and proper for such purposes, may justly be presum'd the original situation of the Planets, and the primary work of Providence in ordering their courses. Such Creatures, Rational, Sensitive, or Vegetative, as are fit and dispos'd for a certain degree of the Sun's heat, are very much incommoded by one much greater, or much less ; and by consequence are peculiarly accommodate to a Circular, but by no means to an Eccentric Orbit. And tho' the inequality of the Earth's distance from the Sun, in the different Points of its Orbit, be so inconsiderable, that we observe little effect of it ; yet in some of the other Orbits, which are much more Eccentric, it must be very sensible, and have a mighty influence on the productions of Nature, and the constitution of Animals in Planets revolving therein. And what reason can we imagine why the Southern Hemisphere, for instance, of a Planet, by the situation of the *Perihelion* near its Summers Solstice, should be so different

*Vid. Arg. 2.
Hypoth. 1c.
infra.*

different from the Northern, in the primary contrivance of the Divine Providence? This seems not so agreeable to the original regularity and uniformity of Nature; nor does it look like the immediate effect of the Divine Power and Wisdom in the first frame of the World, where all things just coming out of the Creator's hands, must be allow'd to have been perfect in their kind, and exceeding good; when the rational Creatures being Pure and Innocent, the natural state of things was to be suited to them; and dispos'd agreeably to reason, proportion, and the convenience of the same unspotted and sinless Creatures.

(2.) The opposite position and use of the opposite Species of Bodies the Comets, seem, by the rule of contraries, to suppose what we have been contending for. If indeed we had found a mixture of Planets and Comets in the same Regions of the Solar System, and a confusion of the Orbits and Order of both: If we had discover'd all species of *Ellipses*, with all degrees of Eccentricity from the Circle to the *Parabola*; the Proposition I am upon would be more than precarious, and but too disagreeable to the frame of Nature. But when we find no such thing, but the clear contrary; namely, That all the Comets revolve in Orbits so extremely Eccentric, that such segments of them as come within our observation are almost *Parabolical*, or of an infinite degree of Eccentricity; 'Tis not unreasonable to conclude, That likely enough the contradistinct Species of Bodies the Planets originally revolv'd in Orbits of no degree of Eccentricity, that is, in perfect Circles: The Eccentric or *Elliptick* Orbits of the one, among other things, probably distinguishing

P

guishing them from the other ; which originally moved in Concentrical or Circular ones.

(3.) This *Hypothesis* is favour'd by the Ancient Astronomy ; which so pertinaciously adher'd to the Circular *Hypothesis*, notwithstanding all its Eccentricks, Epicycles, and strange Wheel-work ; that it may seem the effect of Ancient Tradition, that once the Heavenly Motions were really Circular. And This is the more remarkable, because, not only the true System of the World, but the *Conick Sections*, and among them the *Elliptick* Figure was very anciently known and consider'd. By the introduction of which, all the fanciful and uncouth figments they were forc'd upon, might have been wholly spar'd, and an easie and natural *Idea* of the Planetary Motions obtain'd. Which if ever it had been started, by its exact agreement to the *Phænomena*, could scarce ever have been lost ; and which yet, as far as I know, never came into the Minds of Astronomers till the Great *Kepler's* time ; who first prov'd the Orbits to be *Elliptick* too plainly to be denied, or almost doubted any longer.

(4.) The Quantity of the several Orbits *Eccentricity*, and the Position of their *Apselia*, are so various, different, and without any visible design, order or method, as far as is hitherto discover'd, that the Whole looks more like the result of Second Causes, in succeeding times, than the Primary Contrivance and Workmanship of the Creator himself. 'Tis indeed possible that there *may* be Design and Contrivance in these things, tho' we cannot discern them ; yet seeing we have, on the common grounds, no Reason to affirm such a thing ; seeing the equidistant situation from the Sun would more clearly shew such Design and Contrivance ; seeing also, the original circular Motion

Motion of the Earth granted, the Position of the Earth's *Aphelion*, and the quantity of its Orbit's *Eccentricity*, do so remarkably infer the Divine Wisdom and Artifice therein, and are wonderfully subservient to the highest purposes; (By the one, the Day of the Year when the Flood began; by the other, the length of the Antediluvian Year, being nearly determinable; of which hereafter) 'tis I think, but fair reasoning to conclude, That that *Hypothesis* which does so certainly argue Art and Contrivance, Order and Providence, is to be prefer'd to another, which seems to infer the clean contrary, or at best only leaves room for a possibility thereof; as 'tis in the present case. I do by no means question but these uncertain *Eccentricities* and various Position of the *Aphelia* of the Planets, with all other such seemingly Anomalous *Phænomena* of Nature, happen'd by a particular Providence, and were all one way or other fitted to the state of each Species of Creatures Inhabiting the several Planets, according as their respective Behaviours or Circumstances, in their several Generations requir'd: (of which the succeeding Theory will be a pregnant instance) But my meaning is this; That before any good or bad actions of Creatures, when every thing was just as the Wisdom of God was pleas'd to appoint; when each Creature was compleat and perfect in its kind, and so suited to the most compleat and perfect state of external Nature; 'tis highly probable that the outward World, or every such state of external Nature was even, uniform, and regular, as was the temper and disposition of each Creature that was to be plac'd therein: And as properly suited to all their necessities, and conveniences, as was possible and reasonable to be expected. Such a

state, 'tis natural to believe, obtain'd through the Universe till succeeding changes in the Living and Rational, requir'd proportionable ones in the Inanimate and Corporeal World. 'Tis most Philosophical, as well as most Pious, to ascribe only what appears wise, regular, uniform, and harmonious, to the First Cause; (as the main *Phænomena* of the Heavenly Bodies, their Places, and Motions, do, to the degree of wonder and surprize) but as to such things as may seem of another nature, to attribute them intirely to subsequent changes, which the mutual actions of Bodies one upon another, fore-ordain'd and adjusted by the Divine Providence, in various Periods, agreeably to the various exigencies of Creatures, might bring to pass.

(5.) It being evident, that multitudes of Comets have pass'd through the Planetary System; that in such their passage they were sometimes capable of causing, nay, in very long periods must certainly, without a Miracle, have caused great alterations in the same; and that the nature and quantities of the present *Eccentricities* or *Anomalies* are no other than what must be expected from such Causes; 'tis very reasonable to allow these effects to have really happen'd, and that consequently all might be, as I here contend it was originally, orderly, uniform, and regular; and particularly the Planetary Orbits uniform, concentrical, and circular, as I am here concern'd to prove. If any one of us should observe that a curious Clock, made and kept in order by an excellent Artist, was very notably different from the true time of the day, and took notice withal of a certain rub or stoppage, which was very capable of causing that Error in its Motion; he would easily and undoubtedly conclude

conclude that such an Error was truly occasion'd by that visible Impediment ; and never design'd at first, or procur'd by the Artift. The application of which resemblance, is too obvious to need a Comment, and naturally enforces what I am now contending for.

(6.) 'Tis evident that all the little Planets about *Jupiter* move in Orbits truly Circular, without the least sensible degree of Eccentricity : On which account the present *Hypothesis* appears to be far from contrary to the frame of Nature ; nay to be no other with regard to the *Primary*, than is *de facto*, true in this *Secondary* System: And from that so remarkable a parallel, may the more easily be believ'd to have once been the case of this also.

(7.) 'Tis evident, that in case the Comets Attractions were the cause of the Eccentricity of the Planets, they would usually draw them also from the Plains of their former Orbits, and make them inclin'd or oblique to one another : So that where the Orbits are Eccentric, 'tis probable, according to the present *Hypothesis*, the Plains must be different, and oblique to each other ; and where the Orbits are Circular, the Plains of the several Orbits must be as they were at first, or, in probability, coincident. Now this is really observable in the two Systems last mention'd: The Plains of the Circular Orbits about *Jupiter* being nearly, if not exactly coincident, and those of the Eccentric ones about the Sun being oblique to each other. Which Observation is no inconsiderable Argument, that originally the Planetary Orbits were exactly Circular ; as well as that at the same time they were every one in the same common Plain, or in Plains coincident to one another. Which

last mention'd *Hypothesis*, (to Speak a word or two of that by the way) tho' I look upon it as not unlikely, and such an one as several of the foregoing Arguments might be apply'd to, and do plead for; yet I shall not insist farther upon it here: Both because the following Theory does not directly depend upon it in any part; and because the moving in different Plains does not cause any ill effects, or notable inconveniences, in the System of Nature, as we have shewn the Eccentricity does; and so cannot with the same clearness and force be urg'd against its being the Original Workmanship of God, as I have above discours'd in the other case. Only this I may say, That seeing the Planetary Orbits are still almost in the same Plain; seeing the Comets Passages are capable of causing such little obliquity; nay were they originally in the same Plain, in length of time, by the fore-mention'd Attraction, they must without a Miracle, have been drawn from their common Plains, and been obliged to revolve in those different from each other, as they now do; and seeing withal that *Eccentricity* and *Obliquity*, as *uniformity of distance from the Center, and coincidence of the Plains*, go together in the World, as has been just before noted; this *Hypothesis* of the Original coincidence of the Planetary Plains, is an opinion neither improbable, nor unphilosophical; and only a *little less* evident than what this Proposition was to prove, *viz.* That the Primary Orbits of the Planets were perfect Circles; but otherwise very much a-kin, and exceeding correspondent thereto; they at once receiving light from, and affording light to one another mutually.

VIII. The Ark did not rest, as is commonly suppos'd, in *Armenia*; but on the Mountain *Caucasus*, or *Paropamisus*, on the Confines of *Tartary*, *Persia*, and *India*.

This Proposition is proved by these following Arguments.

(1.) This Mountain agrees to the place where the First Fathers after the Deluge Inhabited; which any part of *Armenia* does not. 'Tis evident from Scripture, that the first removal of the Fathers after the Flood there mention'd, was from the parts on the East of *Babylon*: It came to pass as they journeyed from the East, that they found a plain in the land of *Sbinar*, and they dwelt there; and accordingly there they built the Tower of *Babel*, as you find in the following History. *Gen. xi. 2.* Now *Armenia*, on one of whose Mountains the Ark is commonly suppos'd to have rested, is so far from the Eastern Point from *Babylon*, that 'tis somewhat towards the West, as any Map of those Countries will easily shew. But the Mountain here pitch'd upon, *Caucasus*, or *Paropamisus*, being situate near to the East Point from *Babylon*, is on that account peculiarly agreeable to the History of *Moses*, of the Habitation of the first Fathers after the Flood, and so to the Seat of the Ark thence to be determin'd.

(2.) Norwithstanding we meet with few or no Colonies sent Eastward, after the confusion of Tongues, as we do into other quarters; yet the Eastern Nations appear, in the most Ancient

Prophane Histories of the World, to have been then the most numerous of all others. On which account those Countries must have been first Peopled before the Descent of the Sons of Men to *Babylon*, which the remoteness of *Armenia* is incapable of; but the Neighbourhood of *Caucasus* permits, and naturally supposes. It being probable that if the Sons of *Noah*, for the first Century after the Flood, dwelt upon or near that Mountain, they would first send Colonies, or leave a Company thereabouts, which should stock those Eastern Countries adjoining, before they spread themselves into the remoter parts of *Asia*, *Europe*, and *Africa*; and *vice versa*, seeing they appear to have first Peopled those Regions, 'tis equally probable that they originally were situate at or near the same Regions, *i. e.* at or near the Mountain here determin'd.

(3.) The Testimony of *Porcius Cato* is express in the Point, who affirms, That two hundred and fifty years before *Nimrod*, the Earth was overflowed with Waters; and that *In Scythiâ Sagâ renatum mortale Genus: Mankind was renew'd or restor'd in that part of Scythia which is call'd Saga*, which Country, says *Sir Walter Raleigh*, is undoubtedly under the Mountain *Paropamisus*.

(4.) The same Assertion is confirm'd by the Tradition of the Inhabitants, who, says *Dr. Heylin*, aver, That a large Vineyard in *Margiana*, near the Foot of Mount *Caucasus*, was of *Noah's* Plantation, which may justly be set against any pretended Reliques or Tradition for *Armenia*; and agreeing with the place determin'd by the other Arguments, deserves justly to be preferr'd before them. These are the Arguments, which
from

from *Goropius Becanus*, Sir *Walter Raleigh*, and Dr. *Heylin* make use of in the Case, and which I think are very satisfactory. But I shall add one more, which they take no notice of, but which I esteem so clear, that it might almost alter the Denomination of the Proposition, and give it a claim to a place among the foregoing *Lemmata*, which I propose as certain; not these Propositions, which whatever degree of evidence they or any of them may have, I yet chuse to propose under a softer Name, and call them *Hypotheses*. And the Argument is this;

(5.) The Ark rested upon the highest Hill in all *Asia*, nay, at that time the highest Hill in the World; but *Paropamisus* (the true and most famous *Caucasus*, in the old Authors) is the highest Hill in all *Asia*, nay, was then of the whole World; and is by consequence, the very same on which the Ark rested. Now, in this Argument, I suppose it will be allow'd me, That *Caucasus* is the highest Mountain in *Asia* (Sir *Walter Raleigh* says 'tis undoubtedly so); that it was the highest in the World also at that time, will from the same Assertion be hereafter prov'd, whatever pretence the *Pike of Teneriff*, or any other may at present make: All that therefore I am here to make out, is, That the Ark must have rested on the highest Mountain in the World, which is easily done: For the Waters covering the Tops of all the highest Hills on the Face of the Earth, fifteen Cubits; and yet the Ark resting the very first day of the abatement of the Waters, above two Months before the Tops of other Mountains were seen (as will be proved hereafter:) 'Tis evident, That not only the lower Hills of *Armenia*, but all other in the World, besides *Caucasus*, were incapable of receiving the Ark

at

Sir *Walter Raleigh's*
Hist. lib.
1. cap. 7.
sect. 10.
And *Heylin's* Col-
mog. p. 7,
8.

Lib. 1. cap.
7. sect. 10.
subj. 12.
Solut. 59.
infra.

Phan. 59.
infra.

Gen. viii.

4.

2 Kings

xix. 37.

Isa. xxxvii.

38.

In Loc.

at the time assigned for its resting in the Sacred History; and by consequence, That and That only was the Mountain on which it rested. If it be here objected, That *Ararat*, where the Ark rested, is in Scripture taken for *Armenia*; and by consequence it must be an *Armenian* Mountain which we are enquiring for. In Answer, I grant that *Ararat* is in Scripture taken for *Armenia*; but I deny, that all the Mountains of *Ararat* are included in that Country. 'Tis possible the *Alps* or *Pyrenees*, might give or receive their Names to, or from some small Country at which they rose, or through which they passed; but it would not from thence follow, that all the *Alps* or *Pyrenees* belong'd to, and were contain'd in such a Country. 'Tis usual for vast and long Ridges of Mountains to be call'd by one Name; tho' they pass through, and thereby belong to many and distant Regions, which I take to be the present Case; and that the intire Ridge of Mountains running *West* and *East* from *Armenia* to the Fountains of the Rivers *Oxus* and *Indus*, call'd since by the general Name of Mount *Taurus*, were anciently stil'd *Ararat*, or the Mountains of *Ararat*. To which the *Mosaic* History does well agree, by using the plural number, *The Ark rested on the Mountains of Ararat*, i. e. on one of those Mountains, or of that ridge or aggregate of Mountains going by the general Name it has at its *Western* rise, and stil'd *Ararat*. This is, I think, a fair and satisfactory Interpretation of the Mountains of *Ararat*; and such an one as Bishop *Patrick* embraces, tho' he be by no means partial to that Opinion I here defend thereby. But if any be not yet satisfied of the truth of the Proposition we are upon, they may consult the Authors abovemention'd,

tion'd, who have more at large insisted on it, and alledg'd other Arguments on the same account, to which I shall therefore refer the Reader.

IX. The Deluge began on the 17th Day of the second Month from the Autumnal Equinox, (or on the 27th Day of November in the Julian Stile extended backward) in the 2365th year of the Julian Period, and in the 2349th year before the Christian *Æra*.

In this account of the number of Years from the Deluge, I follow the most Reverend and Learned Archbishop *Usher's* Chronology, deriv'd from the *Hebrew Verity*, without taking notice of what Years the *Samaritan* and *Septuagint* have added thereto; they being, as will hereafter appear, added without reason, and not at all to be consider'd. Now, that the number of Years assign'd by Archbishop *Usher* is rightly deduc'd from the *Hebrew*, is, I think, notwithstanding the wide and manifold Mistakes of the former, pretty well agreed upon among the latest Chronologers; and capable of a much more satisfactory Proof, than from so great Differences before thereto relating one would be ready to imagine, as upon a little enquiry I easily found. Indeed, the Archbishop has made the matter so plain, that one cannot but wonder how former Chronologers came so strangely to be mistaken; and 'tis perhaps one of the most difficult things to give

Coroll. 6.
Hypoth. 10.
infra.

give a good account of, that is readily to be pitch'd upon. I once intended to have here not only given the *Canon* of the several Periods, but confirm'd the same from the Scripture, and answer'd the principal Objections made against any parts thereof; as well from the said Archbishop's incomparable, tho' imperfect *Chronologia Sacra*, as from such other Observations as having been since made, (especially by the very Learned Sir *John Marsham*, who has intirely and evidently clear'd what the Archbishop principally labour'd at without success, the Chronology in the Book of *Judges*) give farther light and strength to the same Accounts. But this would perhaps be too much like a Digression, and somewhat foreign to my main Design, so I forbear, and only set down the *Chronological Canon*, according to which I reckon from the Creation to the present time, as follows.

I. From the beginning of the <i>Mosaick</i> Creation, till the Creation of <i>Adam</i> , 29½ (Days to a Month, till the Deluge.) ———	Y. M. D. 0005—06—11
II. From the Creation of <i>Adam</i> , till the day when the Earth began to be clear of the Waters, or the Autumnal Equinox, in the Year of the Deluge. ———	1656—05—14
III. From the Autumnal Equinox in the Year of the Deluge, till the departure of <i>Abraham</i> out of <i>Haran</i> , (30½ Days to a Month since the Deluge.) ———	0426—06—15
IV. From <i>Abraham's</i> departure out of <i>Haran</i> , till the <i>Exodus</i> of the Children of <i>Israel</i> out of <i>Egypt</i> . ———	0430—00—00
V. From the <i>Exodus</i> of the Children of <i>Israel</i> out of <i>Egypt</i> , till the Foundation of <i>Solomon's</i> Temple. ———	0479—00—17
VI. From the Foundation of <i>Solomon's</i> Temple, till its Conflagration. ———	0424—03—08
VII. From the Conflagration of <i>Solomon's</i> Temple, till the Kalends of <i>January</i> , which began the Christian <i>Era</i> . ———	0587—04—25
VIII. From the beginning of the Christian <i>Era</i> , till this Autumnal Equinox, <i>Anno Domini</i> , 1696. ———	1695—08—26
Sum of all. ———	5705—00—00
From the first day of the Deluge, till the 28 th of <i>October</i> in this same Year, 1696. ———	4044—00—00

This

This *Canon* agrees with the Archbishop's in every thing, but that, for exactness, I make use of *Tropical*, or natural Solar Years, instead of *Julian* ones; to which accordingly I proportion the Months and Days; I add those five Months fourteen Days which his *Hypotbesis* forc'd him, without ground, to omit between the Creation and the Deluge; and I give the primitive Years of the Creation their place, which having been taken for short Days of twenty four Hours long, were not hitherto suppos'd to deserve the same. All which being observ'd, I refer the *Reader*, who desires farther satisfaction, to the Archbishop himself, where he may find the particulars of the several Periods clear'd to him.

X. A Comet, descending, in the Plain of the Ecliptick, towards its *Perihelion*; on the first Day of the Deluge past just before the Body of our Earth.

That such a Position of a Comet's Orbit, and such a passing by as is here suppos'd, are in themselves possible, and agreeable to the *Phænomena* of Nature, All competent Judges, who are acquainted with the new and wonderful Discoveries in Astronomy, according to the *Lemmata* hereto relating, must freely grant. But that it really did so at the time here specified, is what I am now to prove. 'Tis true, when upon a meer Supposition of such a passing by of a Comet, I had in my own mind observ'd the *Phænomena* relating to the Deluge to answer to admiration, I was not a little surpriz'd, and pleas'd at such a
Discovery.

Discovery. It gave me no small Satisfaction to see, that upon a possible and easy *Hypothesis*, I could give so clear an Account of those things, which had hitherto prov'd so hard, not to say inexplicable, and could shew the exact coincidence of the particulars with the Sacred History, and the *Phænomena* of Nature. I thought to be able to proceed so far, was not only more than had been yet done, more than was generally expected ever would be done; but abundantly sufficient to the best of purposes, to clear the Holy Scriptures from the Imputations of ill-disposed Men, and demonstrate the Account of the Deluge to be in every part neither impossible nor unphilosophical. But proceeding in some farther Thoughts and Calculations on the said *Hypothesis*, I, to my exceeding great Content and Admiration, found all things to correspond so strangely, and the time of the Year by several concurring ways so exactly fix'd, agreeably to the Sacred History thereby; that, as I saw abundant Reason myself to rest satisfi'd of the reality, as well as probability of what I before barely suppos'd; so I thought the producing the Particulars I had discover'd might afford evidence to the minds of others, and go a great way to the intire establishing the certainty of that, of whose great probability the Correspondence of the several *Phænomena* of the Deluge had before afforded sufficient satisfaction. But before I come to the Arguments to be here made use of themselves, give me leave by way of Preparation, to shew what sort of evidence such Assertions as this before us, when good and valid, are capable of; and how great or satisfactory it may be in any other, and so may be expected to be in the present Case. 'Tis evident, That all Truths are
not

Lib. 4.
cap. 10.

not capable of the same degree of evidence, or manner of Probation. First Notions are known by Intuition, or so quick and clear a Perception, that we scarce observe any Deduction or Ratiocination at all in our Assent to them. Some principal Metaphysical Truths have so near a Connexion with these, that the manner of reasoning or inferring is scarce to be trac'd or describ'd; a few obvious and quick Reflections enforcing our hearty acquiescence: Among which, the best of Metaphysicians Mr. *Lock*, in his *Essay of Humane Understanding*, very rightly placeth the Being of God. Purely Mathematical Propositions are demonstrated by a chain of deductions, each of which is certain and unquestionable. So that on a clear view of the truth and connexion of each Link, or Member of the intire Argumentation, the Evidence may still be look'd on as infallible. Propositions in mixt Mathematicks, as in Opticks, Geography, and Astronomy, depending partly on abstract Mathematick Demonstrations, and partly on the Observations of the *Phænomena* of Nature; tho' not arriving to the strict infallibility of the evidence with the former sort, are yet justly in most cases allow'd to be truly certain and indubitable. History is all that we commonly can have for matters of fact past and gone; and where 'tis agreed upon by all, and uncontrollable, 'tis esteemed fully satisfactory, tho' not absolutely certain in common Cases. And Lastly, To come closer to the Point, the knowledge of Causes is deduc'd from their Effects. Thus all Natural Philosophy, *i. e.* the knowledge of the Causes of the several visible *Phænomena* of the World, is solely deriv'd from those Effects, or *Phænomena* themselves, their accurate Correspondence

to, and necessary dependance on certain supposed Causes, and their insolubility on any other *Hypotheses*, with the coincidence of the particular Calculations of the Quantities of Motion, Velocity, Periods, and Species of Figures to be every where accounted for. On the Universal Conspiracy and Correspondence of which, with the impossibility of producing an instance to the contrary, depends what may be truly stil'd a *Physical Demonstration*. I mean, Then, and only Then is a Physical Cause to be esteem'd *Demonstrated*, when all the *Phaenomena* of the World may be certainly shewn to be just so, and no otherwise, as they necessarily would, and must be on supposition thereof. This last method is that which our best of Philosophers has taken in his Demonstration of the Universal Affection or Property of Bodies, which he calls *Mutual Attraction* or *Gravitation*, and which accordingly he has establish'd beyond possibility of Contradiction; and this is the sole way of bringing natural Knowledge to perfection, and extricating it from the little *Hypotheses*, which in defect of true Science, the World has till lately been forc'd to be contented with. In the Point before us, there are only three possible ways of proving the truth of the Assertion here laid down. The first, that of Propositions in mixt Mathematicks, by Calculation of the Motion of some Comet, as we do of Planets from the Astronomical Tables, and thence demonstrating the certainty thereof. But besides the improbability of this Comet's having ever return'd since the Deluge; 'tis plain, the defect of old Observations, and the so late discovery of the Laws and Orbits of their Motions, do render such a way of Probation, at least at present, impossible. The second way

Coroll. 4.
Solut. 50.
infra.

of Probation, is that of Historical Relation, that at the Deluge a Comet did so pass by; of which there is directly none in the present Case. Nor seeing the possibility of the same was not known, nor the thing visible to the Inhabitants that out-liv'd the Flood, as will hereafter appear; is this kind of Evidence to be at all expected? But the third and last way, possible, is the Being of such plain and sensible Effects, as must be undoubted consequents of such an Assertion, and without the supposal thereof were perfectly unaccountable; which is the very method of Probation I shall here use, and do wholly depend upon. There are several degrees of evidence, and kinds of proofs, very different from those made use of in the Mathematicks, which yet are little less satisfactory to the minds of wise Men, and leave little more room for doubting than they. Several sorts of Propositions must be evinc'd by several sorts of Arguments; and whatever possible and easy Assertion has all the proofs which its nature requires, or could justly be expected upon supposal of its real Existence, ought to be admitted for true and evident. Thus in that sort of things we are now upon; if a certain Cause be assign'd, which being suppos'd would necessarily infer several plain and visible Effects, and occasion several sensible *Phænomena*; 'tis plain, if those Effects and *Phænomena* be upon Examination found to be correspondent, and as they must and would be on the real being of such a Cause, the existence of that Cause is prov'd. And as where the Effects are few, ordinary, otherwise accountable and incapable of Reduction to Calculation, or accuracy of correspondence in the just Quantity and Proportion necessary; the proof is weak and only

ly probable; and as where several of the consequents of that Cause agree well enough, yet some others disagree, the disagreement of one or two, is a stronger Objection against, than the coincidence of the rest an evidence for the same, and the proof none at all: So on the other side, where a Cause is assigned, whose certain consequent Effects must be very many, very surprising, otherwise unaccountable, correspondent on the greatest niceness of Calculation in the particular Quantity and Proportion of every Effect, and where withal no disagreeing *Phænomenon* can be urg'd to the contrary; the evidence hence deriv'd of the reality of the assigned Cause, tho' of a different nature, and, if you will, degree too, from Demonstration, is yet little less satisfactory to the minds of wise and considering Men, than what is esteem'd more strictly so. Thus, for instance, Astronomers at this day find little more Inclination or Reason to doubt of the Annual and Diurnal Motions of the Earth, than of any strictly demonstrated Proposition; and as much, in a manner, take it for granted in all their Reasonings, as they do the Propositions in *Euclid*, tho' the evidence for the same be in its kind different from, and inferior to the other. And thus, as I have before observ'd, Mr. *Newton* has given sufficient evidence of the Universal Law of *Mutual Attraction* and *Gravitation* of Bodies, which accordingly there is no more occasion to doubt of, than of those common matters of Fact or History, of which no wise Man ever made any question. And thus it is, that I hope to evince the truth and reality of that Cause assigned in this Proposition, viz. by proving that those visible Effects or *Phænomena* relating to the Universal Deluge, which are very many, very surprising

prizing, hitherto unaccountable, several of which are capable of Calculation as to the particular Time, Quantity, and Proportion of the respective particulars, are every one so, and no otherwise, as on supposal of the assigned Cause they either certainly must, or at least probably would have been. And as upon a Demonstration of the disagreement of any one *Phænomenon*, which were a necessary consequence of the same, I must own the falseness of the Proposition before us; so I hope, if the universality of Correspondence, even to the exactness of Calculation in proper cases be establish'd, and no contradictory instance can be produc'd; it will be allow'd, that I have sufficiently evinc'd the reality, and, in a proper Sense, certainty of the same Assertion. This then being premis'd, 'tis plain, that every one of the particular *Phænomena* of the Deluge afterward accounted for, is a proper Argument of this Proposition, and might justly claim a place here on that account. But because such an Enumeration of them before-hand would prevent their own more peculiar place hereafter, and disturb the propos'd method of the ensuing Theory, I shall leave them to their proper places, tho' with this Premonition, That several of them do singly so exactly fit the otherwise unaccountable *Phænomena* of Nature, and of the Deluge, and determine the time and circumstances of the latter so nicely, that their separate evidence is considerable; but when taken conjointly with the rest, as satisfactory as I think the Nature of the thing is capable of. But besides these particular correspondent *Phænomena* of the Deluge, and after the discovery of the most of them, I found proofs of somewhat another nature; which not only confirmed all that

that I had before observ'd, but enabled me to determine the time when the Flood began, to the greatest exactness possible; which therefore I shall alone produce here, reserving those other for their own places hereafter. Now on the *Hypothesis*, that a Comet pass'd by the Earth, till then revolving circularly about the *Sun* at the time, and in the manner assign'd by the Proposition, the necessary Effects or Consequents of it are these Five. (1.) The circular Orbit of the Earth would be chang'd into that of an *Ellipsis*; and the *Sun*, which was before in the Center of the Circle, would be afterward in that *Focus* of the *Ellipsis*, which were nearest the place at which the Attraction of the Comet happen'd. (2.) The Year, after such a passing by of the Comet, would be increased ten Days, one Hour, thirty Minutes. (3.) The time of the passing by of the Comet, or the beginning of the Deluge to be determin'd by the place of the *Peribolion*, must be coincident with that assigned in the *Mosaick History*. (4.) The very day of the Comet's passing by, or of the beginning of the Deluge, to be determin'd from the Astronomical Tables of the Conjunctions of the *Sun* and *Moon*, must be coincident with the time determin'd by the said place of the *Peribolion*, and with the very day assign'd in the *Mosaick History*. (5.) The quantity of Acceleration, to be determin'd *à Priori*, from the force of the Comet's Attraction, must correspond with that which the present *Elliptick* Orbit does require. All which that they are, *de facto*, true and real, I shall now prove.

*Hypothesis 7.
prius.*

*Lem. 48.
cum Coroll.
prius.*

*Lem. 56.
cum Coroll.
prius.
Lem. 52.
cum Coroll.
prius.*

*Lem. 55.
cum Coroll.
prius.*

*Lem. 53.
cum Coroll.
prius.*

(1.) The Orbit of the Earth is now *Elliptical*, and the *Sun* is in that *Focus* thereof, which was

Arg. 3.
Hypoth bu-
jus, infra.

nearest the place of the Earth, when the Deluge began. This Proposition is sufficiently known to Astronomers, as to the former part of it: And if it be consider'd, That the Earth when the Deluge began, was but just past that degree of the *Ecliptick*, where the *Perihelion* was afterward, as will presently appear; the latter part will be equally evident with the former.

(2.) The Year before the Flood was ten days; or more nicely, ten days one hour and thirty minutes, shorter than the present. In order to the proof of which I shall shew first in general, that the Antediluvian Year was different from, nay shorter than the present Year; and afterwards determine the particular length thereof more exactly; and shall comprise what reasons I have for these Assertions in the following Arguments.

Vid. Pha-
nom. 22.
infra.

(1.) The true length of the Solar Year was so long unknown after the Deluge, that there must have happen'd some mighty change and lengthening thereof at the Deluge, or else no rational account can be assign'd of such gross and so lasting an ignorance. 'Tis not to be question'd but the Antediluvian Patriarchs were perfectly acquainted with the Antediluvian Year; every one of those mention'd in Scripture having seen so many Summers and Winters, or natural Solar Years, that himself were able to ascertain their length, and correct any mistake about them. 'Tis also not to be doubted but the Postdiluvians would have retain'd the same Year, and determin'd it by the same number of Days, as their Fore-fathers, had they found it to agree with the Course of the Sun
then,

then, as it did formerly. But 'tis evident from the Ancientest Authors, that 'twas many hundreds of Years after the Deluge e're the most Learned Nations rectifi'd their Year to the Sun's Course, or arriv'd at more than three hundred and sixty Days in their Accounts. Which number accordingly was the Standard of a Year for many Ages, (The full proof of which, and the clearing thereby of several Prophetick Periods, that famous one of *Daniel's* Seventy Weeks especially, is what we impatiently expect from a most Learned Prelate of our Church) till Astronomical Observations forc'd Men to correct the same. Now all this on the present *Hypothesis* is easie and natural; That when the Antediluvian Year was but a few hours above three hundred and fifty five Days; and at the Deluge was insensibly become some odd hours above three hundred and sixty five Days, without the least knowledge or suspicion of any change therein; 'Tis, I say, very easie and natural in this case to suppose, that upon their observing the seasons to be protracted, and return still later every Year than other; (as on the retaining the Antediluvian Year must needs happen,) and consequently their Ancient Standard of three hundred and fifty five days, to be too short for the Sun's Revolution; that they should lengthen their accounts to thirty Days in every Month, and the even number three hundred and sixty Days in the whole Year. Which convenient and remarkable number three hundred and sixty, being probably fixt at the time when Astronomy began to be improv'd, or at least reviv'd after the Deluge, and so become the division of the Ecliptick, and of every Circle of the Sphere; was not quickly chang'd, but measur'd the Ancient Year among not a few Nations,

and that not a few Ages together : As being also less observably different from the Sun's Course, and correspondent both to the degrees of a Circle, and twelve even Months of thirty Days a-piece. And indeed this adjustment of the Year and Months, with the degrees of a Circle, and of each Sign in the Ecliptick, was found so easie, ready, and useful on all accounts, that even when the odd five days were added afterward, they were not inserted into the Months, nor perhaps esteem'd part of the Year, but look'd upon as *ἡμέραι ἐκπιπύουσαι*, adventitious or odd days, of a quite different denomination and character from all the rest. However 'tis still agreeable to the present *Hypothesis*, that on the farther observation of the protraction of the Seasons, and on the improvement of Astronomy still higher, as the Year had been increas'd before from three hundred and fifty five to three hundred and sixty, so afterward it should be increas'd from three hundred and sixty to three hundred and sixty five days; and at last, (the Observations of the more Learned Astronomers enforcing it,) from three hundred sixty five to $365\frac{1}{4}$ or the *Julian* Year, which with us is retain'd to this very day. All this is I think easie and natural in the present case, upon that *Hypothesis* which is here defended; but without it 'tis very strange and unaccountable. 'Tis, I say, very *strange* and *unaccountable* either how the Antediluvian Patriarchs should not know the length of their own Year; or that none of their Posterity, who were destitute of Divine Revelation, should retain the same afterwards, but be forc'd to make use of one that was so far from corresponding to those Seasons, and that Revolution of the Sun which a Year was on purpose design'd to be commensurate

furate to. Which conclusion is farther confirm'd,

(2.) By the Essential difference of the Ancient Years among several Nations since the Deluge: Some of which made use of *Solar*, and others of *Lunar* ones, or endeavour'd to adjust their periods to those of each of these Luminaries. This difference of Years, is known in Antiquity, has been the occasion of great disputes; and is not yet a stranger to the World. Nay, as far as I find, some of those Nations who agreed with the most general Standard of three hundred and sixty days, suppos'd that number agreeable in some measure to the *Lunar*, as well as to the *Solar* course, as consisting nearly of twelve Synodical or Monthly Revolutions of the former, as well as of a single Annual one of the latter; and embrac'd it as much, if not more on the account of its imagin'd correspondence with the *Moon*, as of a like imagin'd correspondence with the *Sun*. Now this Essential difference of *Solar* and *Lunar* Years in the eldest Antiquity after the Flood, is on no other grounds so accountable as that the Antediluvian Year having been delivered down from their Fore-fathers to have agreed with the courses both of the *Sun* and *Moon*, (as on the present *Hypothesis* it really did) some Nations followed *one* Branch, and others *another* of the same Tradition: And when they no longer were commensurate, accommodated their accounts to the one or the other, according as the one or the other was most prevalent, and universal among them. This is an easie and rational account of this Essential difference of *Solar* and *Lunar* Years, so variously followed by so many Nations since the Deluge: Which otherwise, if the Year was of the same length with the present,

sent, and fixt before the Flood, 'tis hard to assign the Original of. But That it were, as in this *Hypothesis*, both a *Solar* and *Lunar* Year, all is very easie, and what must naturally happen upon an imperceptible change at the Deluge. Which will be still farther confirm'd if we consider,

(3.) That the Moon's other Motions, *Diurnal* and *Menstrual*, are still so accurately adjusted and commensurate to each other, that 'tis very probable the *Annual* was alike adjusted and commensurate to those in the primitive Constitution of Nature. 'Tis certain the Moon accompanies our Earth, and has her *Annual* Revolution exactly equal to the others. 'Tis also certain, as has been before observ'd, that her *Menstrual* Periodical Revolution about the Earth, is exactly equal to her *Diurnal* about her own *Axis*: Which wonderful and remarkable coincidence or correspondence of two such intirely distinct motions, renders it highly probable that the third or *Annual* Revolution was not by Providence Originally design'd to be so incommensurate to those others, as since the Deluge it most evidently has been; and that to the greatest trouble and perplexity of many Ages, and the intire disturbance of the Ancient Chronology. Where we cannot but in one case acknowledge, the most exact interposition of Providence in the Equality of the *Menstrual* and *Diurnal* Revolutions; and the notable effect thereof, the exposition of the same Hemisphere of the Moon to the Earth continually: We cannot sure be unwilling to own a like Interposition in the other, in the commensurability and correspondency of the same *Menstrual* and *Diurnal* Revolutions to the *Annual* one of it self, and of its Companion the Earth: Especially where the reason and advantage of such an

I. em. 39.
prim.

an adjustment, (the easie and regular accounts of Time through the World thence arising) is much more plain and evident than in that other case, of which yet there can be no possibility of doubt or hesitation: Which therefore considerably enforces the fore-mention'd *Hypothesis*, according to which the Wise and Careful Interposition of Providence in the Original Constitution of the World, appears to have been as accurately solicitous, and engag'd in the adjustment of the *Annual Motion* to the *Menstrual*, as 'tis unquestionably true in the like correspondence of the *Menstrual* to the *Diurnal*, so worthy the present consideration and admiration of Astronomers: Which will be most of all confirm'd by the exact agreement of the several Periods, to be taken notice of in the next place.

(4.) The *Eccentricity* of the Sun is so exactly coincident with the *Epaet* of the Moon; or the Annual Motion in the Circular Orbit before the Deluge, so nicely equal to thirteen Periodical, and twelve Synodical Revolutions of the Moon; that 'tis very improbable it should be wholly by chance, or without any relation of one to another. The Eccentricities of Planets are various, uncertain, and boundless; and 'twill be next to impossible in such cases to observe accurate coincidences where nothing but Chance is concern'd, and there is no Analogy or Connexion in Nature for 'em. If there were a certain Watchword out of 500 pitch'd upon among certain Conspirators, and a Person was taken on suspicion, and prov'd to have nam'd that very word to his supposed Partner; it were in reason, and the opinion of the World 499. to one he before knew of it, and did not by chance only hit upon it. If any Ancient Historian should assert,
that

that a certain remarkable accident happen'd on such a Day, and such an Hour, of a given Year, and a way was afterward discover'd of determining the time on which, if it really did happen, it must have done so; tho' the Authority of the Author were not considerable otherwise, no doubt would be any more made of his veracity in that point, if the coincidence was so exact as to determine the same hour mention'd by the Historian. Thus if on other intimations it be conjectur'd, that the Earth mov'd circularly before the Deluge, and the Year was both a Solar and Lunar one; and if afterward the *Eccentricity* of the Earth's Orbit, and the Lunar *Epact*, or difference between the Solar and Lunar Year, be reduc'd to Calculation, and found accurately coincident, when the *Eccentricity* of no other of the Planetary Orbits, is at all Correspondent; There is, I think, very great probability to believe that coincidence founded in Nature, and that the alteration of the Year just so much as those agreeing-quantities require, was the true occasion thereof. The *Eccentricity* requisite to correspond to the Lunar *Epact*, must be $\frac{19}{1000}$ of the intire middle distance: That of *Saturn* is $\frac{17}{1000}$ that of *Jupiter* $\frac{18}{1000}$ that of *Mars* $\frac{21}{1000}$ that of *Venus* $\frac{10}{1000}$ that of *Mercury* $\frac{210}{1000}$ that of the *Moon* $\frac{12}{1000}$ which all widely differ from the quantity here necessary. But when we consider the *Eccentricity* of the *Magnus Orbis*, or Orbit of the Earth's and Moon's Annual Course, it exactly accords, and is $\frac{19}{1000}$ of the intire middle distance; as we have before particularly observ'd, and as the Moon's *Epact* most nicely requires. 'Tis, I confess, not *impossible* that Calculations and Numbers, in which there is all imaginable room for diversity under or over, may be coincident, without any natural Dependence or Analogy

Lem. 56.
cum Coroll.
prius.

logy one to another. 'Tis *possible*, that I may several times by guess, or at a venture, hit upon any number which another Person has in his mind. 'Tis *possible*, a Gamester may, without any foul dealing, throw all Sizes or Aces, be the Dice never so many, a hundred times together. These things it must be own'd are *possible*, and so no Compact or Collusion can be *demonstrated* by such Coincidences; neither, consequently, do I pretend that this, or any of the like Coincidences in the present Theory do absolutely *demonstrate* that Assertion they are brought to prove. But as in the former cases, the Observation of the mention'd Coincidences would afford evidence fully *satisfactory* of some Mystery, Cunning, or Artifice us'd therein; so I think it ought to be in the present case; I mean where all things else are rightly correspondent, and no contradictory instances to be alledg'd, the nice and accurate Coincidences of Calculations in this, and the other proper cases through this Theory, ought to satisfy the minds of considering Men of the real truth and evidence of the Proposition on which they all depend, and from which they are deriv'd; and particularly, that the Lunar *Epaet* and *Sun's Eccentricity* which are so nicely equal to each other, must have a natural Relation, and a common Occasion; the alteration of the Year at the Deluge: Which being so far establish'd by these Chronological and Astronomical Arguments, shall be now confirm'd from the Holy Scripture.

(5.) This *Hypothesis* of the ten days addition to the year, is very agreeable to the History of the Deluge in the *Hebrew* it self; and absolutely necessary to reconcile the Text as we have it from the same *Hebrew* verity, with that Translation which
the

the *Septuagint*, and from them *Josephus*, give us thereof. 'Tis commonly, and probably suppos'd, That the space in which *Noah* was in the Ark was a just Solar year: 'Tis expressly so in the *Septuagint* and *Josephus*; the entrance and exit being on the same day of the same month; when yet 'tis in the *Hebrew*, and our Bibles, a year and ten days; the entrance on the 17th, and the exit on the 27th of the second month, as is evident in the Texts quoted in the Margin. Which seeming repugnances have not hitherto met with any satisfactory conciliation, and are generally allow'd to be inconsistent with one another. Some great Men are willing to suppose the year referr'd to at the Deluge, to have been a Lunar one, such as was in after-ages made use of; which in the common years having eleven days less than the Solar, will nearly account for this matter, and pretty well accommodate the whole. But this, I think, will not satisfy, because the *Jewish* Lunar year began at the Vernal, but this at the Autumnal Equinox: because five, at least, of these months had thirty days a-piece, whereas the Lunar had generally thirty, and twenty nine, by turns throughout the year: Because withal this brings the matter only *nearer*, but does not reconcile it, there still wanting a day to that purpose: For when the Moon's Epact is eleven days, the *Hebrew* affords only ten; so that *Noah* must both prevent the Solar year one day, and the *Septuagint* be still irreconcilable with the *Hebrew*, though this conjecture were admitted. All which rightly consider'd, 'tis, I think, evident that this *Hypothesis* of the Lunar year is not only wholly precarious, but indeed indefensible; and were it otherwise, would not be at all advantageous in the case before us; to which therefore

some-

Gen. vii.
11, 13.
& viii. 14,
15, 16, 17.

Vid. Bishop
Patrick in
Loc.

Gen. vii.
24. & viii.
3. with
viii. 4.

somewhat else must be answer'd, and somewhat farther advanced, or the Knot must remain still unsolved at least, if not insoluble. I affirm then, That the allowance of those days, which we have before endeavoured to shew were wanting in the year before the Flood, will take off the difficulty, and reconcile the *Hebrew* with the *Septuagint* to the greatest exactness: And 'tis not a little observable, That the number of days requisite to this reconciliation, are the very same that we have already, from the Eccentricity of the Sun, and the Lunar Epact conspiring together, determined to have been the difference between the Antediluvian and the Post-diluvian year. Let us but therefore suppose the *Hebrew* to make use of that year which was in use at that time to which the History belongs, and which *Noah* in a journal of the Deluge must be allowed to reckon by; and the Translators, after observation had forc'd men to increase the year ten days, to allow for the same, and express the duration of the Deluge, or the space of *Noah's* remaining in the Ark, according to that just year then only current among them, and there is no difficulty left. Now this procedure of receding from the very words or numbers of an Author, in order the more easily and justly to express his meaning, and give a truer *Idea* to the present age, of what was represented at first in a way suitable to that of any History or occurrence, but afterwards forgotten, is a very rational one; and if applied to other Authors and Cases, is neither unusual nor inconvenient. Thus if in an History of the ancient state of *Egypt*, the *Egyptian* years were made use of; a Translator who should, upon the introduction and sole use of the *Julian* year afterwards, re-
duce

duce them all to that, and reckon all the months and days according to that only, he would do at once the greatest justice to the Author, and deserve the thanks of the Reader, for so much easier and more familiar an *Idea* of each period, than a rigid and scrupulous keeping to the Author's own words and numbers could ever have given him. The case is the same as to Weights and Measures us'd by former Ages, or Foreign Nations; which when reduc'd to others equivalent to them in Terms familiar and known, are much more useful than when word answers to word, and number to number in every thing. And if we allow but this to have been the case between *Moses* himself who wrote the *Hebrew* Text, and the *Septuagint* who many Ages after Translated it, we shall find, according to our foregoing calculations, that the year us'd by *Noah* was but Three hundred fifty five days; and that by the *Septuagint*, Three hundred sixty five; and so that space, which with the first Author is certainly a year and ten days, from the 17th to the 27th of the second Month; and is alike evidently a just year from the 27th to the 27th of the same second month with the Translators, are coincident, or the same entire Solar year. Whereby our *Hypothesis* is at once confirmed, and the difficulty arising from the *Hebrew* Text it self, but chiefly as compared with the *Septuagint's* Translation, does entirely vanish and disappear: Which Argument join'd to the foregoing, will, I hope, be thought not inconsiderable.

(3.) The time of the passing by of the Comet, or of the beginning of the Flood, determin'd by the place of the *Perihelion*, is exactly agreeable to that mention'd in the *Mosaic* History. 'Tis certain, That the place of the *Perihelion* of the Earth's

Earth's Orbit is now in the beginning of the eighth degree of *Cancer*: And by Mr. *Flamsteed's* Astronomical Table of its Motion, it goes forward in 4044 Years full 56 Degrees: So that by going back to the time following the Deluge, the *Peribeliion* must then have been at the beginning of the 12th Degree of *Taurus*. It has also been before proved, that the place of the Comets passing by must have been a few Degrees, as five, six or seven, past the *Peribeliion*, that is, on or near the 18th Degree of *Taurus*: Which in the Ancient Year, beginning at the Autumnal Equinox, will fall upon or near the 17th Day of the Second Month: On which very Day, by the express Testimony of the Sacred Historian (agreeing within a Day or two with the Corrected Testimonies of *Abidenus* and *Berosus*) the Deluge began. Which exactness of coincidence I look upon as so remarkable and surprizing, that nothing can be more so; and I need not fear to appeal to the Considering Reader, if this be not the most peculiar and convincing Attestation to our *Hypothesis*, which could easily be desir'd, or in the least wish'd for: That from it not only the several *Phænomena* of the Deluge, but the time of its commencing is so precisely determin'd also; and that in the greatest Correspondence and Harmony with the Sacred History of the same thing imaginable.

(4.) The very day of the Comets passing by, or of the beginning of the Deluge determin'd from the Astronomical Tables of the Conjunctions of the *Sun* and *Moon*, is exactly coincident with that before nearly determin'd by the place of the *Peribeliion*, and exactly by the *Mosaick* History. It has been before prov'd, that seeing the *Moon* still accompanies the Earth, it must

R

needs

Gen. vii.

11.

Vid. Verba

ipsa apud

Langium

de annis

Christi. p.

255.

Lem. 55.

prior.

needs have been three Days past the New or Full, at the passing by of the Comet. It has also been before prov'd, that the Flood began in the Year of the *Julian* Period 2365, or the 2349th before the Christian *Era*. Now it appears by the Astronomical Tables of the Conjunctions of the *Sun* and *Moon*, that the mean New Moon happen'd at the Meridian of *Babylon* just before Eleven a Clock in the Forenoon, on the 24th day of *November*, (in the *Julian* Year) and so at Eleven a Clock on the 27th of *November*, 'twas three days after the New. Which being the 17th day of the Second Month, from the Autumnal Equinox, is the very same pitched upon from the place of the *Peribolion*, and expressly mention'd in the Sacred History: And by so wonderfully corresponding therewith, gives the highest Attestation to our *Hypothesis* that could, for the completion and consummation of the foregoing Evidence, be reasonably desir'd.

(5.) The Quantity of Acceleration determin'd *a priori* from the force of the Comets Attraction, does very well correspond with that which the present *Elliptick* Orbit does require. Upon Calculation according to the *Lemma* quoted in the Margin, the Velocity acquir'd by the Earth on its first change, from a Circular to an *Elliptick* Orbit appears to have been about $\frac{1248}{131250}$ of the intire Velocity; or such as would carry it in three hours and a half's time 1248 Miles. 'Tis also upon calculation evident, from what has been already observ'd, that in case the Comets nearest distance were a quarter of the Moons, or sixty thousand Miles, and it self of much the same bigness with the Earth; (two very probable and easie *Hypotheses*;) the time of the Comets Attraction to be solely consider'd is three hours and a half,

Gen. vii.
11.

LEM. 27.
PRINC.

LEM. 53.
cum coroll.
PRINC.

method of the before-mention'd Year in the following Ages. How often the odd Hours and Minutes were intercalated, and came to just even Days before the Deluge, 'tis not, for a certain reason not here to be mention'd, easie, very exactly to determine; nor perhaps of consequence that it should be so determined. Only in general every sixth year at least, one with another, must be Leap-Year, and have three hundred and fifty six days; as every fourth is Leap-Year, and has three hundred and sixty six days now among us.

Coroll. 2. Every Antediluvian Year and Season, Spring, Summer, Autumn, and Winter, began at Sunset following the Solar ingress into a Cardinal Point, and the Full Moon." It appears, as has been before prov'd, that the Autumnal Equinox preceding the Deluge, happen'd on the 11th day of October. It also appears, by the Astronomical Tables of the Conjunctions of the Sun and Moon, that 'twas Full Moon the same Day: The Night succeeding which Day, began the First Day of Autumn, and the First Day of the Year also. Which being suppos'd, and that, as we have prov'd, the Solar Year was exactly coincident with twelve Synodical Months, or the Lunar Year, it must necessarily have been ever so. And not only the other particular seasons, but the Year it self began at the most remarkable time possible. The Astronomers had a double coincidence to observe, at the conclusion of one, and the commencing another year, viz. The Autumnal Equinox, and the Full Moon: Which must for ever fix and establish the constancy of their Annual space. And even the Countryman had somewhat easily observable to fix his Account, and Characterize his Year, the Full Moon Rising when the Sun set, as the same common period of the Old, and introducer of the New Year. So that in so regular and truly natural Solar and Lunar Years

Lem. 4th.
prior.

as then obtain'd, no Observations of Astronomers were necessary to adjust or calculate their measures of Time; Nature, or rather Divine Providence, having so fitted the Heavenly Revolutions, that nothing more than the easie observation of a Full Moon was necessary to determine their Seasons, and their Years, and to retain them at a constant setting out, with the Equinoctial and Solstitial Points in the Heavens. Than which Disposition, nothing of such a nature could more clearly demonstrate the Wise Provision of the great Creator; or more usefully be subservient to Mankind.

Coroll. 3. Hence we easily understand the primary occasion of the confusions in Astronomy and Chronology after the Flood, notwithstanding they might have been well understood before it. While the Solar and Lunar Years were equal, and every one of them began both at the Equinox, and at the Full Moon; (this latter, observable by all, fixing the former, observable but by a few,) 'Twere next to impossible to suppose any difference in Years, or in the Accounts of Time depending thereon. But upon an imperceptible change of the Year at the Deluge, and the consequent incommensurate duration of the Solar and Lunar Periods, 'Tis natural to suppose great diversity of Years, and perplexity of Accounts. Some might long retain their Ancient Year, and suffer its Head to wander through all Seasons: Others might retain their Ancient Year, as far as it agreed with the twelve Lunations or Months afterward, and make use of a Lunar-year: Whose Head they might either, as the former, suffer to wander through all Seasons, or fix as well as they could by the intercalation of a Month, as oft as they found so much deficiency from the Solar Year. And as the former sort, having a regular Cycle, or constant method for the finding the Head of their Months and Years, needed no other Observations, so

the latter must always remark the phases of the Moon, and begin their Months, or Years, or both at some observable Point of an entire Lunation, as at the Full or New Moon, or so soon as any decrease or increase of its Light became sensible. Some might strive to find out the number of Days necessary to be added to their old Year, and so to reduce the same to the true Solar Revolution; and accordingly might first make every Month thirty Days, and the Year three hundred and sixty, till that appearing too little, five more Days, and at last the odd six Hours were by degrees added, and the Civil became almost equal to the Natural Year. While others were intent upon the Adjustment of the Solar and Lunar Periods, and inventing Cycles for the correspondence of those several Accounts, which were respectively followed by several Nations. All which variety of reckoning, with its natural consequences, must cause strange Confusion in the accounts of Time, and create mighty Difficulties in the Ancient Chronology; very agreeably to what every one knows to have been really the case, who searches into such Matters, to what our Hypothesis lays a rational Occasion and Foundation for, and to what, without such a supposed change at the Deluge, is by no means accountable.

Coroll. 4. When the number Three hundred and sixty is not only a middle proportional between the Days in an Antediluvian and Postdiluvian Year, and nearly between the present Solar and Lunar Year, is not only the number of Degrees in the Ecliptick, and in every Circle or Orbit; but was the just number of Days in a Year among so many Nations, for so many Ages. The reason of that Prophetick Style, in which a Day, or Year thereby meant, does plainly signify Three hundred and sixty Days, and no more, is clear and evident. What Difficulties the want of this Observation, that Daniel's Prophetick

phetic Year consisted of Three hundred and sixty Days, has left unsolv'd, and what light may be afforded to some places of the highest importance thereby, I had rather the Reader should be left to his own Observations, and that Work so impatiently expected, of which I made mention before, than prepossess him with any more particular instances thereof in this place.

Coroll. 5. *When the very day of the beginning of the Deluge, nearly determin'd by the place of the Perihelion, and exactly by the Astronomical Tables of the Conjunctions of the Sun and Moon, is the very same individual Day with that mention'd by the Sacred Writer; hence arises a very surprizing and unexpected Confirmation of the Verity of the Scripture History. Here is a great and signal instance of the wonderful Providence of God indeed, and of his care for the Credit and Establishment of the Holy Books; that he has left us means sufficient, after above Four thousand Years, of examining and ascertaining the Veracity of the most Ancient of its Writers, and in one of the most scrupled and exceptionable Points of his Narration, that of the Universal Deluge; and that from unexceptionable Principles, the Astronomical Tables of the Caelestial Motions. To how great a degree this thing will deserve the most serious Consideration of every one, especially in this our Sceptical Age, I need not determine. The importance of the concern, and the greatness of the Evidence hence afforded, sufficiently enforcing this Point, without any farther Application.*

Coroll. 6. *The years added in the Samaritan Pentateuch and Septuagint to the accounts of Time, from the Hebrew Verity, since the Deluge, are added without reason, and are contrary to the Truth, and to the Sacred Writings together. For whereas, by the Hebrew Verity, and the Astronomical Tables*

of the place of the Perihelion, and of the Conjunctions of the Sun and Moon; (not to mention the Testimonies of Abidenus and Berofus here) the Deluge's beginning is fix'd to the Seventeenth day of the Second Month from the Autumnal Equinox, or to the 27th of November in the Year of the Julian Period 2365, and the 2349th before the Christian Æra; (by reason of the just number of 4044 Years since past and elapsed;) In case those Eight hundred or Nine hundred Years which the Samaritan and Septuagint have added, are to be allowed for, all is put thereby into Confusion. The Situation of the Moon necessary to this matter is lost, and no reasonable Account to be given of her still accompanying the Earth. The place of the Perihelion, and Day of the beginning of the Deluge thence nearly determin'd, must have been about twelve Degrees, and as many Days sooner; and the Day which Noah entered into the Ark must have been not the Twenty seventh of the Second Month, as even the Septuagint by their way of reckoning were oblig'd to express it; nor the Seventeenth day of the same Month, as the Hebrew Verity and Samaritan Pentateuch do rightly determine it; but rather the Fifth of the same Month, contrary to the Faith and Agreement of all Copies and Translations in the World. So that upon the whole, the intire force of this Reasoning, and the conjoint Influence of the several ways by which this Hypothesis fixes the day of the Deluge so nicely, conspires to confirm and give undoubted Attestation to the Hebrew Verity; and consequently to destroy the Authority of the Samaritan and Septuagint, so far as they contradict the same, in the matters herein concern'd.

Coroll. 7. Hence the Chronology of the Bible is establish'd, and all the pretended immense numbers of Years, which the Annals of some Nations recount, are confuted. For as the Year of the Deluge, from the Hebrew

Hebrew Chronology given, the Day of the beginning of the Deluge therein assign'd is fully attested to, and determin'd on our Hypothesis, from Astronomy; so, vice versâ, the Day of the beginning of the Deluge from the same Sacred History given, (and within a Day or two confirm'd from Abydenus and Berosus corrected) the number of Years thereby assign'd, is at the same time establish'd also. The Methods before-mention'd of fixing that Day, not permitting the Addition or Subtraction of a few hundreds, much less many thousands of Years, to or from those Four thousand and forty four, which the Holy Scriptures require us to account since that time: Which therefore ought to be fully acquiesced in; and all other wild and extravagant Numbers be utterly rejected.

Coroll. 8. Hence, upon supposition that the Comet was of any given Magnitude, the height of the Tide, or elevation of the Abyss, with its incumbent Orb, may be reduc'd to Calculation, and its Quantity consider'd and compar'd with the Phenomena depending on it. Thus for instance, if the Comet were half as big as the Earth, which will hereafter appear *vid. Solur. §8. infra.* far from truth, and consequently approach'd eight times as near as the Moon, or Thirty thousand Miles off us; at its nearest distance, the elevation of the Abyss, or the height of the Tide above its former Position must have been near eight Miles. For the Moon elevates the Ocean about six Feet above its moderate State; a Comet at the same distance, (half as big as the Earth, which is) Thirteen times as big as the Moon, would elevate the same Thirteen times as high, or Seventy eight Feet; and at an eighth part of its distance *Lem. 80, 81. prius.* Five hundred and twelve times as high as the last, or Thirty nine thousand nine hundred and thirty six Feet, which is very near the before-mentioned height of eight Miles. Which Elevation of the Abyss seems very agreeable

able to the Phenomena afterwards to be observ'd, and so within a due Latitude establishes the foregoing Hypotheses of the nearness of the Comets approach, and the consequent bigness of the Comet it self before-mention'd.

SCHOLIUM.

Having thus establish'd this main Proposition, 'twill here be proper to describe as near as the Phenomena of Comets, and of the Deluge, afford us any guidance, the particular Trajectory of the Comet, or that part of it which could be concern'd with us, and our lower Planetary Regions, which accordingly, in a mean between such as approach exceeding near to, and such as remain at somewhat remoter distances from the Sun in their Perihelia, and agreeably to that Historical Trajectory of the last famous Comet delineated by Mr. Newton, I shall here attempt. For tho' 'twere folly to think of delineating the very same in which the Comet revolv'd, yet we may easily come pretty near it; we may give the Reader a clear and distinct Idea of the whole matter, and enable him to judge of any particular consequences occasionally to be drawn therefrom. Now verbal Descriptions in such cases being of small advantage, compar'd to Schemes and Graphical Delineations, I shall wave more words about it, and exhibit an intire Figure of the whole to the view and consideration of the Reader. From the careful Observation whereof the following inferences may be easily drawn.

Fig. 1.

Corollary 1. The Earth would twice pass quite through the Tail of the Comet; the first time at the beginning of the Deluge, and the second about Fifty three

three or fifty four Days after: Their several Motions, then bringing them to the Situation describ'd in the Figure.

Coroll. 2. At the second passing by of the Comet, before its cutting the Ecliptick in its Ascent from the Sun, about Sixty two Days after the former passage, the Moon, which at the first was three Days past the New, at this last time must have been within a day or two of its Quadrature, past the like Conjunction.

Coroll. 3. If at the first passing by of the Comet, the Moon was a small matter nearer the Comet than the Earth had been just before; she would be accelerated somewhat more than the Earth, and by her Position at the second passage she would be a little more retarded than the Earth; and upon the whole might afterward retain an equal Velocity with it, as 'tis certain she still does.

Coroll. 4. That former superabundant Velocity would in the intermediate space cast the Moon farther off the Sun, and thereby make it approach nearer the Earth at the Conjunction or New; and recede farther from it at the Opposition or Full than it did before. Which things being so, it may deserve consideration, whether the present Eccentricity of the Moon's Orbit about the Earth, might not, without any change in its periodical Revolution, be hence deriv'd? And so, Whether the Menstrual Course were not as truly circular before the Deluge, as we have already shew'd the Annual to have been? Especially, when the Situation of the Moon's Apogæon was, from the present Astronomical Tables, somewhat near that place which according to such an Hypothesis, and such a Trajectory of the Comet, it ought to have been, I mean the latter degrees of Cancer, or the former of Leo.

Coroll.

Coroll. 5. 'Twas almost the New Moon when the Comet's Tail involv'd the Earth and the Moon the second time; as the Position of the Earth in the Figure, with the consideration of the place of the Moon then, will easily shew.

BOOK

 BOOK III.

 PHÆNOMENA.

CHAP. I.

Phænomena relating to the Mosaick Creation, and the Original Constitution of the Earth.

I. **A**LL those particular small Bodies of which our habitable Earth is now compos'd, were originally in a mixed, confused, fluid, and uncertain Condition; without any order or regularity. It was an *Earth without form, and void*; had *darkness* spread over the *face of its Abyss*; and in reality was, what it has been ever stil'd, a perfect *Chaos*.

The Testimonies for this are so numerous, and the Consent of all Authors, Sacred and Prophane, so unanimous, that I need only refer the Reader to them for the undoubted Attestation of it.

II. The Formation of this Earth, or the Change of that *Chaos* into an habitable World, was not a meer result from any necessary

Gen. i. 2.
Grot Ver.
Rel. Christ.
l. 1. Sect.
16. Burn.
Theor. l.
1. c. 4. and
l. 2. c. 7.
8. Arch.
l. 2. c. 1.

necessary Laws of *Mechanism* independently on the Divine Power; but was the proper effect of the Influence and Interposition, and all along under the peculiar Care and Providence of God.

The Testimonies for this are so numerous, and so express, both in the *Mosaick* History it self, in the other parts of Scripture relating thereto, and in all Antiquity, that I may refer the Reader to almost every place where this matter is spoken of, without quoting here any particulars. He who is at all acquainted with the Primitive Histories of this rising World, whether Sacred or Prophane, can have no reason to make any doubt of it.

III. The Days of the Creation, and that of Rest, had their beginning in the Evening.

Gen. 1. 5, 8, 13, 19, 23, 31. *The Evening and the Morning were the first Day.* And so of the rest afterward.

IV. At the time immediately preceding the six days Creation, the face of the *Abyss*, or superior Regions of the *Chaos*, were involv'd in a thick Darkness.

Gen. i. 2. *Darkness was upon the face of the Deep.* To which Testimony the Prophane Traditions do fully agree; as may be seen in the Authors before refer'd to.

V. The visible part of the first days Work, was the Production of Light, or its successive appearance to all the Parts of the Earth; with the consequent distinction of Darkness and Light, Night and Day upon the face of it.

God said, *Let there be Light; and there was Light: And God saw the Light that it was good,* and God divided the light from the darkness: And God called the light, *Day,* and the darkness be called *Night: And the Evening and the Morning was the first day.* Gen. i. 3, 4, 5.

VI. The visible part of the Second Days Work was the elevation of the Air, with all its contained Vapours; the spreading it for an *Expansum* above the Earth; and the distinction thence arising of Superior and Inferior Waters: The former consisting of those Vapours, rais'd and sustain'd by the Air; the latter of such as either were enclosed in the Pores, Interstices and Bowels of the Earth, or lay upon the Surface thereof.

God said, *Let there be a firmament, or Expansum, in the midst of the waters, and let it divide the waters from the waters. And God made the firmament, and divided the waters which were under the firmament, from the waters which were above the firmament: And it was so; and God called the firmament Heaven. And the Evening and the Morning were the second day.* ver. 6, 7, 8.

VII. The visible parts of the Third Day's Works were two, the former the Collection of the inferior Waters, or such as were now under the Heaven into the Seas, with the consequent appearance of the dry Land; the latter the production of Vegetables out of that Ground so lately become dry.

God

ver. 9, 10,
11, 12, 13.

God said, *Let the waters under the heavens be gathered together unto one place, and let the dry land appear; and it was so. And God called the dry land Earth; and the gathering together of the waters called he Seas: And God saw that it was good. And God said, Let the Earth bring forth grass, the herb yielding seed, and the fruit-tree yielding fruit after his kind, whose seed is in it self upon the earth; and it was so. And the earth brought forth grass, and herb yielding seed after his kind, and the tree yielding fruit, whose seed was in it self after his kind; and God saw that it was good. And the Evening and the Morning were the third day.*

VIII. The Fourth Day's Work was the Placing the Heavenly Bodies, Sun, Moon and Stars, in the *Expansum* or Firmament, *i. e.* The rendring them Visible and Conspicuous on the Face of the Earth: Together with their several Assignations to their respective Offices there.

ver. 14, 15,
16, 17, 18,
19.

God said, *Let there be lights in the Expansum, Or, firmament of heaven, to divide the day from the night; and let them be for signs and for seasons, and for days and years; and let them be for lights in the firmament of heaven, to give light upon the earth; and it was so. And God made two great lights; the greater light to rule the day, and the lesser light to rule the night; he made the stars also. And God set them in the firmament of the heaven, to give light upon the earth; and to rule over the day, and over the night, and to divide the light from the darkness; and God saw that it was good. And the Evening and the Morning were the fourth day.*

IX. The Fifth Day's Work was the Production of the Fish and Fowl out of the Waters;

Waters; with the Benediction bestow'd on them in order to their Propagation.

God said, Let the Waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven. And God created great Whales, and every living creature that moveth, which the waters brought forth abundantly after their kind; and every winged fowl after his kind; and God saw that it was good. And God blessed them, saying, Be fruitful and multiply, and fill the waters in the Seas; and let fowl multiply in the earth. And the Evening and the Morning were the fifth day.

ver. 20, 21,
22, 23.

X. The Sixth Day's Work was the Production of all the Terrestrial or Dry-land Animals; and that in a different manner. For the Brute Beasts were produc'd out of the Earth, as the Fish and Fowl had been before out of the Waters: But after that the Body of Adam was form'd of the Dust of the Ground; who by the Breath of Life breath'd into him in a peculiar manner, became a Living Soul. Some time after which, on the same day, he was cast into a deep Sleep, and Eve was form'd of a Rib taken from his side. Together with several other things, of which a more particular account has been already given on another occasion.

Hypoth. 3.
p 89. &c.
prior.

God said, Let the Earth bring forth the living creature after his kind, cattel and creeping thing, and beast of the Earth after his kind; and it was so. And God made the beast of the earth after his kind, and cattel after their kind, and every thing that

ver. 24, 25,
26, 27.

creepeth upon the earth after his kind; and God saw that it was good. And God said, Let us make man in Our Image, after Our likeness, and let them have dominion over the Fish of the sea, and over the fowl of the air, and over the cattel, and over all the earth, and over every creeping thing that creepeth upon the earth. So God created Man in his own image, in the image of God created he him; Male and Female created he them, &c. Vid. ver. 28, 29, 30, 31. and Cap. 2. 7, 15, &c.

XI. God having thus finish'd the Works of Creation, Rested on the Seventh day from the same; and Sanctified or set that day apart for a Sabbath, or day of Rest, to be then and afterward observ'd as a Memorial of his Creation of the World in the six foregoing, and his Resting or keeping a Sabbath on this seventh day. Which Sabbath was reviv'd, or at least its Observation anew enforc'd on the Jews, by the Fourth Commandment.

Gen. ii. 1,
2, 3.

Thus the Heavens and the Earth were finished, and all the host of them, and on the seventh day God had ended his work which he had made; and he rested on the seventh day from all his work which he had made. And God blessed the seventh day, and sanctified it, because that in it he had rested from all his work which God created and made.

Exod. 20.
8, 9, 10, 11.

Remember that thou keep holy the Sabbath day. Six days shalt thou labour, and do all thy work: But the seventh day is the Sabbath of the Lord thy God; in it thou shalt do no manner of work, thou, nor thy son, nor thy daughter, nor thy man-servant, nor thy maid-servant, nor thy cattel, nor the stranger which is within thy gates: For in six days the Lord made Heaven and Earth, the Sea, and all that in them is, and

and rested the seventh day; wherefore the Lord blessed the seventh day, and hallowed it.

XII. There is a constant and vigorous heat diffused from the Central towards the Superficiary parts of our Earth.

Tho' I might bring several Arguments from Ancient Tradition, the Opinion of great Philosophers, and the present Observations of Nature for this Assertion; yet I shall chuse here, for brevities sake, to depend wholly on the last evidence, and refer the inquisitive Reader to what the Learned Dr. Woodward says in the present case; which I take to be very satisfactory.

Essay, Part
3. Sect. 1.

XIII. The Habitable Earth is founded or situate on the Surface of the Waters; or of a deep and vast Subterraneous fluid.

This Constitution of the Earth is a natural result from such a *Chaos*, as we have already assign'd; affords foundation for an easie account of the Origin of Mountains; renders the Histories of the several states of the Earth, and of the Universal Deluge very intelligible; is as Philosophical, and as agreeable to the common *Phænomena* of Nature as any other; without this supposition 'twill be, I believe, impossible to explain what Antiquity, Sacred and Prophane, assures us of relating to the Earth, and its great *Catastrophes*; but this being allow'd, 'twill not be difficult to account for the same to the greatest degree of satisfaction, as will appear in the progress of the present *Theory*: And Lastly, The same assertion is most exactly consonant to, and confirm'd by the Holy Scriptures; as the following Texts will fairly evince:

Vid. Theor.
L. 1. Cap. 5
& 11. &
2. Ca
L. & 10. P.
7.

Po. viii.
27, 28, 29.

When the Lord prepared the heavens I was there :
When he set a compass (Circle or Orb) on the face
of the deep : When he established the clouds above,
when he strengthened the fountains of the deep : When
he gave to the sea his decree, that the waters should
not pass his commandment ; when he appointed the
foundations of the earth.

Pf. xxiv. 2.

He hath founded the earth upon the seas, and
establish'd it upon the floods.

& cxxxvi.
6.

To him that stretch'd out the earth above the wa-
ters ; for his mercy endureth for ever.

2 Pet iii.
5, 6.

This they willingly are ignorant of, that by the
word of God the heavens were of old, and the Earth,
standing out of the water, and in the water ; where-
by the world that then was, being overflowed with
waters, perished.

Gen. vii.
11

The fountains of the great deep were broken
up.

& viii. 2.

The fountains of the deep were stopped.

XIV. The interior or intire Constitution
of the Earth is correspondent to that of an
Egg.

Vid. Theor.
L. 1. C. 5.
& L. 2.
C. 10.

'Tis very well known that an Egg was the so-
lemn and remarkable Symbol or Representation
of the World among the most venerable Anti-
quity ; and that nothing was more celebrated
than the Original, *ἡ πρώτη ὕλη*, in the most early
Authors ; which if extended beyond the Earth
to the System of the Heavens, is groundless and
idle ; if referr'd to the Figure of the Earth, is
directly false, and so is most reasonably to be
understood of the intire and internal Constitution
thereof.

Lem. 67,
& 68. cum
Coroll.
prim.

XV. The Primitive Earth had Seas and
Dry-land distinguish'd from each other in
great measure as the present ; and those si-
tuate

uate in the same places generally as they still are.

This is put past doubt by part of the third, the intire fifth, and part of the sixth Day's Works. One half of the third being spent in distinguishing the Seas from the Dry-land; the intire fifth in the Production of Fish and Fowl out of the Waters, and in the assigning the Air to the latter sort, and the Seas to the former for their respective Elements; and on the sixth, God bestows on Mankind the Dominion of the Inhabitants, as well of the Seas as of the Dry-land. All which can leave no doubt of the truth of the former part of this Assertion. And that their Disposition was originally much what as it is at present, appears both by the Rivers, *Tigris* and *Euphrates*, running then into the same *Persian* Sea that now they do; And by the Observations of Dr. *Woodward* fully confirming the same.

Gen. i 9,
10.
Verse 20,
21, 22, 23.

Verse 26.
28.

Essay. pag.
252, 253.

XVI. The Primitive Earth had Springs, Fountains, Streams, and Rivers, in the same manner as the present, and usually in or near the same places also.

This is but a proper consequence of the Distinction of the Earth into Seas and Dry-land; the latter being uninhabitable without them; and such Vapours as are any way condensed into Water on the higher parts of the Dry-land, naturally descending and hollowing themselves Channels, till they fall into the Seas. However, the other direct proofs for both parts of the Assertion are sufficiently evident.

I was set up from everlasting, from the beginning, or ever the earth was. When there were no depths, I was brought forth; when there were no fountains abounding with water.

Prov. viii.
23, 24.

Gen. ii.
10, &c.

A river went out of Eden to water the garden; and from thence it was parted, and became into four heads, Pifon, Gihon, Tigris, and Euphrates: The two latter of which are well-known Rivers to this very day. And the same thing is confirm'd by Dr. Woodward's Observations.

Essay, P.
255.

XVII. The Primitive Earth was distinguish'd into Mountains, Plains, and Vallies, in the same manner, generally speaking, and in the same places as the present.

This is a natural consequent of the two former: The Caverns of the Seas, with the extant Parts of the Dry-land, being in effect great Vallies and Mountains; and the Origin and Course of Rivers necessarily supposing the same. (For tho' the Earth, in the Theorist's way, were Oval, which it is not, 'tis demonstrable there could be no such descent as the course of Rivers requires.) However the direct proofs are evident.

Prov. viii.
22, 23, 25,
26.

The Lord possessed me in the beginning of his way, before his works of old. I was set up from everlasting, from the beginning, or ever the Earth was. Before the mountains were settled: before the Hills was I brought forth: While as yet he had not made the earth, nor the fields, nor the highest part of the dust of the world.

Job xv. 7.

Art thou the first man that was born? or wast thou made before the hills?

Psaln xc.
1, 2.

Lord, thou hast been our dwelling place from one generation to another. Before the mountains were brought forth, or ever thou hadst formed the earth and the world, even from everlasting to everlasting, thou art God. And indeed these three last Phænomena are in their own Natures so linked together, they so depend on, and infer one another mutually, that the proofs of each of them singly may justly be

be esteemed under the same Character to both the other ; and all of them are thereby establish'd past all rational Contradiction. Of which whole matter , Dr. *Woodward's* Observations are a sufficient Attestation also.

Essay, p.

249—

252. and

255—

258.

XVIII. The Waters of the Seas in the Primitive Earth were *Salt*, and those of the Rivers *Fresh*, as they are at present, and each, as now, were then stor'd with great plenty of Fish.

This appears from the difference of the *Species* and Natures of Fishes, some being produc'd and nourish'd by Salt Water, others by Fresh ; and yet all created on the fifth Day. And this in all its parts is confirm'd by Dr. *Woodward's* Observations.

Essay, p.

253, 254,

255.

XIX. The Seas were agitated with a like *Tide*, or *Flux* and *Reflux*, as they are at present.

There is in it self no reason to doubt of this ; and 'tis moreover attested by Dr. *Woodward's* Observations.

Essay, p.

254.

XX. The Productions of the Primitive Earth, as far as we can guess by the remainders of them at the Deluge, differ'd little or nothing from those of the present, either in Figure, Magnitude, Texture of Parts, or any other correspondent respect.

This is prov'd by Dr. *Woodward's* Observations.

Essay, p.

22, 23,

258.

XXI. The Primitive Earth had such *Metals* and *Minerals* in it, as the present has.

In the land of Havilah there was gold ; and the gold of that land was good, there was bdellium and the onyx-stone. Gen. ii. 11, 12.

Gen. iv. 22. Tubal-cain, *was an instructor of every artificer in brass and iron.* Which is withal attested by Dr. Woodward's Observation.

Essay, Part 4. Vid. p. 258, 259.

XXII. Arts and Sciences were invented and improv'd in the first Ages of the World, as well as they since have been.

Gen. iv. 2. Abel *was a keeper of sheep, but Cain was a tiller of the ground.*

Verse 17. Cain *builded a city, and called it after the name of his son Enoch.*

Verse 20. Jabel *was the father of such as dwell in tents, and of such as have cattel.*

Verse 21. Jubal *was the father of all such as handle the harp and organ.*

Verse 22. Tubal-cain *was an instructor of every artificer in brass and iron.* See also the Right Reverend Bishop Patrick, on Gen. iv. 20, 21, 22, 25. and v. 18.

CH A P. II.

Phænomena relating to the Primitive State of the Earth.

XXIII. **T**HE Primitive State of the Earth admitted of the primary Production of Animals out of the Waters and dry Ground, which the subsequent States, otherwise than in the ordinary method of Generation have been incapable of.

Vid. Grot. Verit. Rel. Christ. l. 1. sect. 16. Theor. 1. 1. c. 5. l. 2. c. 7.

This appears from the History of the Creation, compar'd with that of Nature ever since. By the former of which, (agreeing with the oldest

est Traditions) 'tis evident, That the Fishes and Fowls were the immediate Productions or Offspring of the Waters, and the Terrestrial Animals of the Dry-land in the *Primitive* State of the Earth: And by the latter 'tis equally so, that neither of those Elements have afforded the like ever since.

XXIV. The Constitution of Man in his *Primitive* State was very different from that ever since the Fall, not only as to the Temper and Perfections of his Soul, but as to the Nature and Disposition of his Body also.

This the whole Drift and Series of the Sacred History of this *Primitive* State supposes; in which these two Particulars may here be taken notice of: (1.) Nakedness was no shame, and so no sense of any need to cover it does appear. Those Inclinations which provide for the Propagation of Mankind were, it seems, so regular, and so intirely under the command of Reason, that not so much as an Apron was esteem'd necessary to hide those Parts, which all the World have since thought proper to do. (2.) The Temper of the Humane Body was more soft, pliable, and alterable than now it is: Some sorts of Fruits and Food were capable of causing a mighty change therein, either to fix and adapt it to its present Condition, or discompose and disorder it; *i. e.* in other words, either to render it Permanent and Immortal on the one hand; or to devolve upon it Diseases, Corruption, and Mortality on the other. What concerns the Soul, or its moral Perfections, is without the compass of this *Theory*, and not here to be consider'd.

Gen ii.
25. and iii.
7, 10, 11.

Cap. ii. 9,
16, 17.
and iii. 1,
&c.

XXV. The

XXV. The Female was then very different from what she is now; particularly she was in a state of greater equality with the Male, and little more subject to Sorrow in the Propagation of Posterity than he.

(1.) Her Names were as much as possible the very same with his. The Husband was call'd *Adam*, the Wife *Adamah*; the Husband *Iſſch*, the Wife *Iſſchah*. God called their Name *Adam* in the day that they were created. She shall be called *Iſſchah*, because she was taken out of *Iſſch*.
 Gen. v. 2. and ii. 23, 24.

(2.) We find little to infer any Inequality or Subjection till after the Fall. *Adam* said, *This is now bone of my bone, and flesh of my flesh: Therefore shall a man leave his father, and his mother, and shall cleave unto his wife, and they shall be one flesh.*
 Chap. iii. 16. Unto the woman God said, (after the Fall) thy desire shall be (subject to) thine husband, and he shall rule over thee. (3.) Her pains in Conception and Childbirth were inconsiderable in comparison of what they since have been. Unto the woman God said, (after the Fall) I will greatly multiply thy sorrow, and thy conception; in sorrow thou shalt bring forth children.
 Ibid.

XXVI. The other Terrestrial Animals were in a state of greater Capacities and Operations; nearer approaching to reason and discourse, and partakers of higher degrees of Perfection and Happiness, than they have been ever since.

This appears, (K) From the necessity or occasion of a particular view and distinct consideration of each Species of Animals before *Adam* was satisfied that none of them were a Help meet
 Gen. ii. 20.

meet for him, or suitable to his Faculties and Condition. (2.) From the *Serpent's* discourse with the Woman: In which, tho' the *Old Serpent*, the *Devil*, was also concern'd, yet the particular *Subtily* of the *Serpent* is taken notice of as a means of her Deception, and a Curse denounced and inflicted on the same Beast upon account thereof. Now the *Serpent* was more subtil than any beast of the field, which the Lord God had made, &c. I fear lest by any means, as the *Serpent* beguiled Eve through his subtilty. The Lord God said unto the serpent, Because thou hast done this, thou art cursed above all cattel, and above every beast of the field; upon thy belly shalt thou go, and dust shalt thou eat all the days of thy life. (3.) From St. Paul's Discourse in the Eighth Chapter to the Romans, For the earnest expectation of the creature waiteth for the manifestation of the Sons of God. For the creature was made subject to vanity, not willingly, but by reason of him who hath subjected the same in hope: Because the creature it self also shall be delivered from the bondage of corruption, into the glorious liberty of the children of God. For we know that the whole creation groaneth and travaileth in pain together, until now.

Gen. iii. 1.

2 Cor. xi.

3.

Gen. iii.

14.

Rom. viii.

19, 20,

21, 22.

XXVII. The temper of the Air, where our first Parents liv'd, was warmer, and the heat greater before the Fall than since.

This appears, (1.) From the heat requisite to the Production of Animals, which must have been greater than we are since sensible of. Of which the hot Wombs in which the *Fetus* in *viviparous* Animals do lye, and the warm brooding of the *Oviparous*, with the hatching of Eggs in Ovens, are good evidence. (2.) From the nakedness of our first Parents. (3.) From that peculiarly warm
cloathing

Gen. ii. 25.

Chap. iii.
21.

cloathing they immediately stood in need of afterwards, the Skins of Animals. *Unto Adam also, (after the Fall) and to his wife, did the Lord God make coats of skins, and cloathed them.*

XXVIII. Those Regions of the Earth where our first Parents were plac'd, were productive of better and more useful Vegetables, with less Labour and Tillage than since they have been.

Gen. ii. 15.

The Lord God took the man, and put him into the garden of Eden to dress it, and to keep it; (before the Fall).

Chap. iii.
17, 18, 19.

The Lord God said unto Adam, (after the Fall) Cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life. Thorns also and thistles shall it bring forth to thee, and thou shalt eat the herb of the field. In the sweat of thy face shalt thou eat bread, till thou return unto the ground, for out of it wast thou made.

XXIX. The *Primitive* Earth was not equally Paradisiacal all over. The Garden of *Eden* or *Paradise* being a peculiarly fruitful and happy soil, and particularly furnish'd with the necessaries and delights of an innocent and blessed life, above the other Regions of the Earth.

Gen. ii. 8,
9.

The Lord God planted a Garden Eastward in Eden, and there he put the man whom he had formed: And out of the ground made the Lord God to grow every tree that is pleasant to the sight, and good for food; the tree of life also in the midst of the garden, and the tree of knowledge of good and evil.

Chap. iii.
23, 24.

The Lord God sent the Man forth from the garden of Eden to till the ground from whence he was taken: So he drove out the man.

XXX.

XXX. The place of Paradise was where the united Rivers *Tigris* and *Euphrates* divided themselves into four streams, *Pison*, *Gibon*, *Tigris* and *Euphrates*.

Of this see the fourth *Hypothesis* before laid down.

XXXI. The Earth in its *Primitive State* had only an *Annual Motion* about the Sun: But since it has a *Diurnal Rotation* upon its own *Axis* also: Whereby a vast difference arises in the several States of the World.

Of this with all its consequents see the third *Hypothesis* before laid down.

XXXII. Upon the first commencing of this *Diurnal Rotation* after the Fall, its *Axis* was oblique to the plain of the *Ecliptick* as it still is: Or in other words, the present vicissitudes of Seasons, *Spring*, *Summer*, *Autumn* and *Winter*, arising from the Sun's access to, and recess from the *Tropicks*, have been ever since the Fall of Man.

God said, on the fourth Day, *Let there be lights in the firmament of the heaven, to divide the day from the night; which was their proper office till the Fall. And let them be, ever after, for years, and for seasons, and for days, and years.* After the Flood, *While the Earth remaineth, Seed-time and Harvest, and Cold and Heat, and Summer and Winter, and Day and Night shall not cease.* Implying, that tho' the Seasons; as well as Night and Day, had been, during the Deluge, scarcely distinguishable from one another; yet the former as well as the latter distinction had been in nature before:
And

Gen. i. 14.

Cap. viii.
ult.

And surely the Spring, Summer, Autumn and Winter, with their varieties of Cold and Heat, Seed-time and Harvest, were no more originally begun after the Deluge, than the succession of Day and Night mention'd here together with them is by any suppos'd to have been. But of this we have at large discours'd under the third *Hypothesis* foregoing already; to which the Reader is farther referr'd for satisfaction.

CHAP. III.

Phænomena relating to the Antediluvian State of the Earth.

XXXIII. **T**HE Inhabitants of the Earth were before the Flood vastly more numerous than the present Earth either actually does, or perhaps is capable to contain and supply.

In order to the proof of this Assertion, I observe, (1.) That the Posterity of every one of the *Antediluvians*, is to be suppos'd so much more numerous than of any since, as their lives were longer: This is but agreeable to the Sacred History, in which we find two at sixty five, and one at seventy years of Age to have begotten Children: While the three Sons of *Noah* were not begotten till after their Father's five hundredth year: When yet at the same time the several Children of the same Father appear to have succeeded as quickly one after another as they usually do at this day. For as to *Cain* and *Abel*, they appear

Gen. v. 15,

21.

ver. 12.

ver. 32.

appear to have been pretty near of an Age, the World being at the death of the latter, not without considerable numbers of People, tho' their Father *Adam* was not then an hundred and thirty years old; and so in probability contain'd many of the Posterity of both of them. (Which by the way fully establishes the early begetting of Children just now observ'd in the *Antediluvian* Patriarchs, and if rightly consider'd, overturns a main Argument for the *Septuagint's* Addition of so many Centenaries in the Generations Before and After the Deluge.) And as to the three Sons of *Noah*, born after the five hundredth year of their Father's Life, 'tis evident that two of them at the least, *Japhet* and *Sem*, were born within two years one after another. All which makes it highly reasonable to suppose, that in the same proportion that the Lives of the *Antediluvians* were longer, was their Posterity more numerous than that of the *Postdiluvians*. (2.) The Lives of the *Antediluvians* being pretty evenly prolong'd, without that mighty inequality in the periods of humane Life, which we now experience, the proportion between the Lives of the *Antediluvians* and those of the *Postdiluvians*, is to be taken as about nine hundred the middle period of their Lives; to twenty two, the middle period of ours: Which is full forty to one. And accordingly in any long space, the *Antediluvians* must have forty times as numerous a Posterity, as we usually allow with us for the same space, on account thereof. (3.) On account of the *Coexistence* of so many of such Generations as are but successive with us, we must allow the *Antediluvian* number of present Inhabitants to have been in half an Arithmetical proportion of such their longer lives after the duration of the first

Gen. iv.
14, 15.
with 25.

Vid. Cap.
vii. 13.
with v. 32.

Gen. v. 32.
& vii. 11.
& viii. 13.
with xi.
10.

Vid. Gravut
On Bills
of Mortal.
p. 84.

first Fathers is expir'd, and a gradual decrease of the Ancient stock going off, as well as a gradual increase of the New stock coming on, to be allow'd for : Till which time the proportion is not to be diminish'd. So that on this account for the first nine hundred years of the World the number of Inhabitants on the Face of the Earth, must be esteem'd forty times as great as in so long time are now derivable from a single Couple ; and afterwards twenty times so ; which *Postulata* suppos'd, I shall propose a Calculation (built upon certain matter of fact) first how many they *might* have been by the Deluge ; and afterward another or two, relying alike on Matter of fact, how many 'tis probable they *really were*, and must have been at the same time.

(1.) 'Tis evident from the Sacred History, and not to be denied by those who forsake the *Hebrew* Chronology themselves, or who would lessen the numbers of the *Antediluvians* ; That in the space of about two hundred sixty six years, the Posterity of *Jacob* alone, by his Sons, (without the consideration of *Dinah* his Daughter) amounted to six hundred thousand Males, above the Age of Twenty, all able to go forth to War.

Now by Mr. *Graunt's* Observations on the Bills of Mortality it appears that about $\frac{11}{100}$ are between the Ages of sixteen and fifty six : Which may be near the proportion of the *Males* numbred, to the intire number of them all. So that as thirty four to an hundred, by the Golden Rule, must six hundred thousand be to the intire number of the Males of *Israel* at that time : Which was therefore one Million seven hundred sixty four thousand and seven hundred. To which add *Females*, near $\frac{1}{13}$ fewer, as suppose, to make the sum even, one Million six hundred thirty five thousand

Exod. xii.

37.

Numb. i.

45, 46.

Pag 85.

Pag. 64.

thousand, three hundred, the *Total* is, three millions, and three hundred thousand; add forty three thousand for the *Levites*, (not included in the former accounts,) the intire Sum will at last amount to three millions, and three hundred forty three thousand Souls. Now if we suppose the increase of the Children of *Israel* to have been gradual, and equal through the whole two hundred sixty six years, it will appear that they doubled themselves every fourteen years at least; which proportion, if we should continue it through the entire hundred and fourteen Periods, (which the space from the Creation to the Deluge admits) the product or number of People on the face of the Earth at the Deluge would be the hundredth and fourteenth place in a Geometrick double proportion, or series of numbers, two, four, eight, sixteen, &c. where every succeeding one were double to that before it: Which to how immense a Sum it would arise, those who know any thing of the nature of Geometrick Progressions will easily pronounce, and may be soon tried by any ordinary Arithmetician. So that without allowing for the *Longevity*, and that *Coexistence*, and more numerous *Off-spring* thereon depending, without taking as advantageous an *Hypothesis* as one might precariously, tho' possibly, do in such a case; If the *Antediluvians* had only multiplied as fast before, as 'tis certain the *Israelites* did since the Flood for the assigned term; the numbers of Mankind actually Alive and *Coexisting* at the Deluge, must have been, not only more than the Earth now does or possibly could maintain, but prodigiously more than the whole number of Mankind can be justly suppos'd ever since the Deluge, nay indeed, with any degree of likelihood, ever

Numb. iii.
39.
Cap. i. 47.
48, 49.

since the Creation of the World. On which account this Calculation must not be at all esteem'd a real one, or to exhibit in any measure the just number of the Posterity of *Adam* alive at the Universal Deluge. But it serves to shew how vastly numerous, according to the regular method of humane Propagation, the Offspring of a single person may certainly be; and this on a Calculation from undoubted matter of fact, not from a meer possible *Hypothesis*, (according to which numbers prodigiously greater would still arise.) It demonstrates the probability, if not certainty, of Mankind's Original from a common head as well before as since the Deluge, and that within a few Millenaries of years. It, lastly, is more than sufficient to demonstrate the Proposition we are upon, that the whole Earth must have been peopled long before the Flood, and at its approach have contain'd vastly more in number than the present does or can do. So that altho' I do not pretend to give a particular guess at the number of the *Antediluvians* thereby, yet I thought it not improper to be here inserted. Which first Computation being thus dispatch'd I come to the (2.) which I take to be very probable, and very rational; and perhaps, within certain limits, to be admitted in the present case: Namely, That the Primary increase of Mankind after the Creation, (that the World might not be destitute of Inhabitants for many Ages) was not, at least considering their greater *Longevity*, less than that of the *Israelites* in *Egypt* before-mention'd: But that afterwards, (which was the case of the *Israelites* also) a much less proportion obtain'd. Upon which fair and modest *Postulata* I shall demonstrate the truth of that proposition

position we are now upon. In order to which I observe, from Mr. *Graunt*, that at this day the number of People does so increase, that in two hundred and eighty years, the Country doubles its People, and the City of *London* much sooner. Let us therefore suppose that after the first two hundred and sixty six years of the World, the former of those proportions were observed (and that must by all be own'd sufficiently fair;) and compute how many the number of People must on such a Calculation arise to before the Deluge. When therefore after the first two hundred and sixty six years, there was near five periods, each of two hundred and eighty years, (if the *Longevity* of the *Antediluvians*, and the consequent *Coexistence* and more numerous posterity were excluded) the number of the Inhabitants by the Deluge would amount to about thirty times the former sum of three millions three hundred forty three thousand, or one hundred millions two hundred and ninety thousand of Souls. But if we withal allow, as we ought, that this number is on account of *Coexistence* to be twenty times as great; and on account of more numerous posterity forty times so (which is on both accounts eight hundred times as great as the last mention'd); the number of People at the Deluge will amount to eighty thousand two hundred and thirty two millions; which number, since the present Inhabitants of the Earth, as some conjecture, scarcely exceed three hundred and fifty millions, is above two hundred and twenty nine times as great as the Earth now actually contains upon it, and by consequence many more than at present it could contain and supply. And this *Hypothesis* and Calculation are confirm'd by what I shall propose in the (3.) Place, and which must by

Pa. 59.
85, 86.

all be allow'd very fair and reasonable, namely, That tho' Mankind, *Cæteris Paribus*, increas'd but in the same proportion before, as they have done since the Deluge; we shall find, upon a due allowance for the two things before-mention'd, *Coexistence* and more numerous *Posterity*, that the number last assign'd is rather too small than too great, and the numbers of the Inhabitants of the Earth were more than the present Earth does or can maintain, many years before the approach of the Deluge. For if the number of years before had been the same as that since the Flood, the Inhabitants, tho' they had been no longer livers than we now are, would have been as numerous as the present. But because the number of years before the Deluge wanted about two thousand four hundred of that since; we must allow or abate the increase, which has arisen in the last two thousand and four hundred years: Which, since in these latter ages it has been double in two hundred and eighty years, and so in two thousand and four hundred years about three hundred times as great as before; the *Antediluvians*, if their lives had been no longer than ours since, must have been but the three hundredth part so many as the Earth now contains upon it. But when on the two fore-mention'd accounts, the number is to be eight hundred times as great, and on this only three hundred times as small; the excess is on the side of the *Antediluvians*, and their number five hundred times as great as that of the present Inhabitants of the Earth. So that on this last *Hypothesis*, which I suppose none can justly except against, tho' the present Earth be allow'd capable of maintaining five times as many People as are now by computation upon it; yet will it

it appear that the *Antediluvian* Earth maintain'd an hundred times as many. Which I imagin not to be wide from probability; and, being so near the calculation before, may be allow'd as reasonable in the present case.

XXXIV. The Bruit Animals whether belonging to the Water or Land, were proportionably at least, more in number before the Flood than they are since.

This I think generally look'd upon as no other than a reasonable deduction from the last Proposition; and is very fully attested by Dr. *Woodward's* Essay, pa. 257, 258. Observations, as far as the remains of those Ages afford any means of knowing the same: And so ought in reason to be universally allow'd.

XXXV. The *Antediluvian* Earth was much more fruitful than the present; and the multitude of its vegetable productions much greater.

This is both necessary to be allow'd by reason of the multitude of its Inhabitants, rational and irrational, maintained by them; of which before: And abundantly confirm'd also by Dr. *Woodward's* Essay, pa. 84, &c. & 257, 258. Observations.

XXXVI. The Temperature of the *Antediluvian* Air was more equable as to its different Climates, and its different Seasons; without such excessive, and sudden heat and cold; without the scorching of a *Torrid Zone*, and of burning Summers; or the freezing of the *Frigid Zones*, and of piercing Winters; and without such sudden and violent changes in the Climates or Seasons from one extreme to another, as the present Air, to our sorrow, is subject to.

Theor. 1.
2. c. 1. &
10. Archæ-
l. 2. c. 5,
& 6.

These Characters are extremely agreeable to, and attested by, the ancient Accounts of the Golden Age. The gentleness of the *Torrid* and *Frigid Zones* is necessary to be suppos'd in order to the easie Peopling of the World, with the dispersion and maintenance of those numerous Inhabitants we before prov'd it to have contain'd: Which if they were as now they are, would be very difficultly accountable. The gentleness of Summer and Winter, with the easie and gradual coming on, and going off of the same Seasons, are but necessary in order to the very long lives of the *Antediluvians*; which else 'twere not so easie to account for. And indeed the most of those Testimonies which have been suppos'd favourable to a perpetual *Equinox* before the Deluge, are resolv'd into this Proposition; and if it can be separately establish'd, need not be extended any farther.

XXXVII. The Constitution of the Antediluvian Air was Thin, Pure, Subtile and Homogeneous, without such gross Steams, Exhalations, Nitrosulphureous, or other Heterogeneous mixtures, as occasion Coruscations, Meteors, Thunder, Lightning, Contagions, and Pestilential Infections, in our present Air; and have so very pernicious and fatal (tho' almost insensible) effects in the World since the Deluge.

This is the natural consequent, or rather original, of the before-mention'd equability and uniformity of the *Antediluvian Air*: This must be suppos'd on the account of the *Longævity* of the Inhabitants: And this is very agreeable to the last cited descriptions of the Golden Age.

The

The contrary Heterogeneous and Gross *Atmosphere*, which now encompasses the Earth, is disagreeable to a regular state, (which an original formation from the *Chaos* supposes) as containing such Dense and Bulky Exhalations, and Masses, which at first must have obtain'd a lower situation, and were not to be sustain'd by the Primitive Thin and Subtile Air or *Æther*. Such mixtures as this Proposition takes notice of, or those effects of them therein mention'd, have no Footsteps in Sacred or Prophane Antiquity, relating to the first Ages of the World; there is no appearance of them in the Serene and Pelucid Air of the Moon, or of the generality of the Heavenly Bodies, and so there can be no manner of reason to ascribe them to the *Antediluvian* state.

XXXVIII. The *Antediluvian* Air had no large, gross Masses of Vapours, or Clouds, hanging for long seasons in the same. It had no great round drops of Rain, descending in multitudes together, which we call Showers: But the Ground was watered by gentle Mists or Vapours ascending in the Day, and descending, in great measure, again in the succeeding Night.

This Assertion is but a proper consequent of such a Pure, Thin, Rare *Æther* as originally encompass'd the Earth. 'Tis very agreeable to the descriptions of the Golden Age, and to the present *Phænomena* of most of the Planets (especially of the Moon, whose face, tho' so near us, is never obscur'd or clouded from us.) 'Tis necessary to be suppos'd in an Air without a Rainbow, as the *Antediluvian* was; (of which pre-

Theor. I.
2. C. 1.

sently) and is indeed no other than the words of the Sacred History inform us of.

Gen. ii. 5,
6.

The Lord God had not caused it to Rain upon the Earth, — But there went up a Mist from the Earth, and watered the whole face of the ground.

XXXIX. The *Antediluvian* Air was free from violent Winds, Storms, and Agitations, with all their effects on the Earth or Seas, which we cannot now but be sufficiently sensible of.

This the foregoing *Phænomena* enforce: So Homogeneous, Pure, and Unmix'd a Fluid, as that Air has been describ'd to have been, by no means seeming capable of exciting in it self, or undergoing any such disorderly commotions or fermentations. Where no Vapours were collect'd into Clouds; there must have been no Winds to collect them; where the Climates preserv'd their own proper temperature, no Storms must have hurried the Air from colder to hotter, or from hotter to colder Regions; where was no Rainbow, there must have been no driving together the separate Vapours into larger *Globules*, or round drops of Rain, the immediate requisite thereto. This is also highly probable by reason of the perpetual tranquility of the Air for the first five intire Months of the Deluge, (as will be prov'd anon) which is scarce supposable if Storms and Tempests were usual before.

Vid Phæ-
nom. 55.
infra.

XL. The *Antediluvian* Air had no Rainbow; as the present so frequently has.

Gen. ix.
12, 13, 14,
15, 16, 17.
Vid
Theo. I. 2.
c. 5.

God said, (after the Deluge) *This is the token of the covenant which I make between me and you, and every living creature that is with you, for perpetual generations. I do set my bow in the cloud; and it shall be for a token of a covenant between me and*

and the earth. And it shall come to pass when I bring a cloud over the earth, that the bow shall be seen in the cloud. And I will remember my covenant, which is between me and you, and every living creature of all flesh; and the waters shall no more become a flood to destroy all flesh. And the bow shall be in the cloud, and I will look upon it, that I may remember the everlasting covenant between God and every living creature of all flesh that is upon the earth. And God said unto Noah, this is the token of the covenant which I have establish'd between me and all flesh that is upon the earth.

XLI. The Antediluvians might only Eat Vegetables; but the Use of Flesh after the Flood was freely allow'd also.

God said, (to our first Parents in Paradise) Behold I have given you every herb, bearing seed, Gen. i. 29, 30. which is upon the face of all the earth; and every tree, in the which is the fruit of a tree yielding seed, to you it shall be for meat; and to every beast of the earth, and to every fowl of the air, and to every thing that creepeth upon the earth wherein there is life; I have given every green herb for meat: And it was so.

God blessed Noah and his sons, (after the flood) Cap. ix. 1, 2, 3. and said unto them, Be fruitful and multiply, and replenish the earth. And the fear of you, and the dread of you shall be upon every beast of the earth, and upon every fowl of the air, upon all that moveth upon the earth, and upon all the fishes of the sea; into your hand are they delivered. Every moving thing that liveth shall be meat for you; even as the green herb have I given you all things. To which when the Prince of Latin Poets so exactly agrees, let us for once hear him in the present case.

Ante

Vir. Georg
lib. 2. sub
calce.

*Ante etiam sceptrum Dictæi Regis, & antè
Impia quàm cæsis gens est epulata juvencis,
Aureus in terris hanc vitam Saturnus agebat.*

XLII. The Lives of the *Antediluvians* were more universally equal, and vastly longer than ours now are: Men before the Flood frequently approaching near to a thousand, which almost none now do to a hundred years of Age.

Grot. ubi
suprà.
Theor. 1.
2. c. 3.
Hor. Ode
3.

This is both fully attested by the most ancient Remainers of prophane Antiquity, and will be put past doubt hereafter by a Table of the Ages of the *Antediluvians*, out of the fifth Chapter of *Genesis*. *Semotique prius tarda necessitas Leti corripuit gradum.*

XLIII. Tho' the *Antediluvian* Earth was not destitute of lesser Seas and Lakes, every where disper'd on the Surface thereof; yet had it no *Ocean*, or large receptacle of Waters, separating one Continent from another, and covering so large a portion of it, as the present Earth has.

Vid. etiam
Coroll. 2.
Solut. 7.
infra.

This is evident, Because (1.) the number of the *Antediluvians* before assign'd, must have been too numerous for the Continents alone to maintain: (2.) The Ark appears to have been the first Pattern and Instance for Navigation (which had there been an *Ocean*, must have been very perfect long before); and this seems probable from the constant silence concerning Navigation in the Golden Age, from the common Opinion of all Authors; and from the necessity of the most minute and particular Directions from God himself

Gen. vi.
14, 15, 16.

himself to the Fabrick of it in the *Mosaick* History. (3.) That famous Tradition among the Ancients of the drowning a certain vast Continent, call'd *Atlantis*, bigger than *Africa* and *Asia*, seems to be a plain Relique of the Generation of the *Ocean* at the Deluge, and consequently of that *Antediluvian* State, where the greatest part of what the *Ocean* now possesses was Dry-land, and inhabited as well as the rest of the Globe. (4.) The Generation of the *Ocean*, with the Situation of the present great Continents of the Earth, will be so naturally and exactly accounted for at the Deluge, that when that is understood there will remain to those who are satisfied with the other Conclusions, small reason to doubt of the truth of this before us. (5.) The Testimony of *Josephus* (if the *Theorist* hit upon his true Sense) is agreeable, who says, At the Deluge God *Εἰς θάλασσαν ἤνευεν τὴν γῆν*; *chang'd the Continent into Sea.*

Archæol.
p. 241.
Theor. 1.
1. c. 6.

Theor. 1.
2. c. 10.
p. 180.

C H A P. IV.

Phænomena relating to the Universal Deluge, and its Effects upon the Earth.

XLIV. **I**N the Seventeenth Century from the Creation, there happen'd a most extraordinary and prodigious Deluge of Waters upon the Earth.

This general Assertion is not only attested by a large and special Account of it in the Sacred Writings, but by the universal Consent of the most ancient Records of all Nations besides, as
may

Grot. ubi may be seen in the Authors quoted in the Margin; and is put moreover past doubt by Dr. Woodward's Natural Observations *.

Suprà.

Bish. Stillingfleet's

Orig. l. 3. c. 4. Edward's Authority of Script. p. 118, &c. And Commentators on Gen. 6. and 7. * Essay, Pref. and Part 3. Sect. 2.

XLV. This prodigious Deluge of Waters was mainly occasion'd by a most extraordinary and violent Rain, for the space of forty Days, and as many Nights, without intermission.

Gen. vii. 4. Yet seven days, and I will cause it to rain upon the earth forty days and forty nights.

Verse 11, The windows of heaven were opened, and the rain was upon the Earth forty days and forty nights.

12. And the flood was forty days upon the earth.

Verse 17. XLVI. This vast quantity of Waters was not deriv'd from the Earth or Seas, as Rains constantly now are; but from some other Superior and Cœlestial Original.

This is evident, Because (1.) the *Antediluvian* Air (as was before prov'd) never retain'd great quantities of Vapours, or sustained any Clouds capable of producing such considerable, and so lasting Rains, as this most certainly was. (2.) The quantity of Waters on the *Antediluvian* Earth, where there was no Ocean, (as we saw just now) was very small in comparison of that at present, and so could contribute very little towards the Deluge. (3.) If the quantity of Waters on the Face of the Earth had then been as great as now, and had all been elevated into Vapours, and descended on the Dry-land alone, it were much too small to cause such a Deluge as this was. (4.) But because, if the Waters were all rais'd into Vapours, and descended in Rain, they must either fall upon, or run down into the Ocean, the Seas, and those Declivities

Viñ. Th.
l. f. c. 2.

Declivities they were in before, they could only take up and possess their old places; and so could not contribute a jot to that standing and permanent Mass of Waters which cover'd the Earth at the Deluge. (5.) The Expression us'd by the Sacred Historian, that the Windows, Flood-gates, or *Cataracts* of Heaven were open'd at the fall, and shut at the ceasing of these Waters, very naturally agrees to this Superior and Cœlestial Original.

Gen. vii.
11.
And viii.
2.

XLVII. This vast fall of Waters, or forty Days rain, began on the fifth day of the Week, or *Thursday* the twenty seventh day of *November*, being the seventeenth day of the second Month from the *Autumnal Equinox*; (corresponding this Year 1696. to the twenty eighth day of *October*.)

In the six hundredth year of Noah's life, in the second month, the seventeenth day of the month, the windows of heaven were opened, and the rain was upon the earth forty days and forty night.

Gen. vii.
11.

Thus *Abydenus* and *Berosus* say it began on the fifteenth day of *Æsius*, the second Month from the *Vernal Equinox*; which, if the mistake, arising 'tis probable from the ignorance of the change in the beginning of the Year at the *Exodus* out of *Egypt*, be but corrected, is within a day or two agreeable to the Narration of *Moses*, and so exceedingly confirms the same.

*Langius de
annis Chri-
sti, p. 255.*

XLVIII. The other main cause of the Deluge, was the breaking up the Fountains of the great *Abyss*, or the causing such Chaps and Fissures in the upper Earth, as might permit the Waters contain'd in the Bowels of it when violently press'd and squeez'd

squeez'd upwards to ascend, and so add to the quantity of those which the Rains produced.

Gen. vii.

11.

Job

xxxviii. 8.

All the fountains of the great deep were broken up. The sea brake forth, as if it had issued out of the womb.

XLIX. All these Fountains of the great Deep were broken up on the very first day of the Deluge, or the very first day when the Rains began.

Gen. vii.

11.

In the six hundredth year of Noah's life, in the second month, the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened.

L. Yet the very same day, Noah, his Family, and all the Animals entred into the Ark.

Gen. vii.

13, 14.

In the self-same day, last mention'd, entred Noah, and Shem, and Ham, and Japheth, the sons of Noah, and Noah's wife, and the three wives of his sons with them into the ark: They, and every beast after his kind, and all the cattel after their kind, and every creeping thing that creepeth upon the earth after his kind, and every fowl after his kind, every bird of every sort.

LI. Tho' the first and most violent Rains continued without intermission but forty days, yet after some time the Rains began again, and ceased not till the seventeenth day of the seventh Month, or a hundred and fifty days after the Deluge began.

This is very probably gather'd from the mighty increase of the Waters, even after the first forty days Rain were over; and from the express fixing of the stoppage of the Rains to the last day here assigned.

The

The Waters prevailed, and were increased greatly. Gen. vii.

And the waters prevailed exceedingly upon the Earth. 18. Verse 19.

The waters prevailed (or were increased) upon the Earth an hundred and fifty days. And God remembered Noah, and every living thing, and all the Cattel that was with him in the Ark: And God made a wind to pass over the Earth, and the waters asswaged. The fountains also of the deep, and the windows of heaven were stopped; and the rain from heaven was restrained. Verse 24. Cap. viii. 1, 2.

LII. This second, and less remarkable Rain was deriv'd from such a cause as the former was.

This Proposition is (1.) Very fair and probable in it self. (2.) Gives an account of the augmentation of the Waters by their fall, when had they been only exhaled and let fall again, as our Rains now are, they would have added nothing thereto. (3.) Is exactly agreeable to the expressions in *Moses*; who says *the Windows of Heaven* which were *open'd* at the beginning of the first, were not shut or *stopped* till the end of this second Rain; thereby plainly deriving this latter, as well as the former, from a Superiour and Celestial original. *The fountains of the deep and the windows of heaven were stopped, and the rain from heaven was restrained.* Gen. viii. 2.

LIII. Tho' the fountains of the great deep were broken up, and the forty days Rain began at the same time, yet is there a very observable mention of a threefold growth, or distinct augmentation of the Waters; as if it were on three several accounts, and at three several times.

The

Gen. vii.
17.

The flood was forty days upon the earth, and the waters increased, and bare up the ark, and it was lift up above the earth.

Verse 18.

And the waters prevailed, and were increased greatly; and the ark went upon the face of the

Verse 19.

waters.

And the waters prevailed exceedingly upon the earth, and all the high hills that were under the whole heaven were cover'd.

LIV. The Waters of the Deluge increas'd by degrees till their utmost height; and then decreas'd by degrees till they were clearly gone off the face of the earth.

This is evident from the intire series and course of the *Mosaick History*, in the seventh and eighth chapters of *Genesis*.

LV. The Waters of the Deluge were Still, Calm, free from Commotions, Storms, Winds, and Tempests of all sorts, during the whole time in which the *Ark* was afloat upon them.

Gen. vi. 15.

This is evident from the impossibility of the *Ark's* abiding a Stormy Sea, considering the vast bulk, and particular figure of it. For since it was three hundred Cubits long, fifty Cubits broad, and thirty Cubits high: Which is, according to the most accurate determination of the Cubits length, by the Right Reverend the Lord Bishop of *Peterborough*, above five hundred and forty seven English feet long, above ninety one feet broad, and near fifty five feet high: And since withal it appears to have been of the figure of a Chest, without such a peculiar bottom, and proportion of parts, as our great Ships are contriv'd with; 'tis evident, and will be allow'd by Persons skill'd in Navigation, that 'twas

Bishop
Cumber-
land's
Weights
and Mea-
sures, p.
34.

'twas not capable of enduring a Stormy Sea. It must, whenever either the Ridges or Hollows of vast Waves were so situate, that it lay over-cross the one or the other, have had its back broken, and it self must have been shatter'd to pieces; which having not happen'd, 'tis a certain evidence of a calm Sea during the whole time it was afloat.

LVI. Yet during the Deluge there were both Winds and Storms of all sorts in a very violent manner.

God made a wind to pass over the earth, and the waters asswaged. Gen. viii. 1.

Thou coverest the earth with the deep, as with a garment; the waters stood above the mountains. At thy rebuke they fled; at the voice of thy thunder they hasted away. They go up by the mountains; they go down by the vallies unto the place which thou hast appointed for them. Psalm civ. 6, 7, 8.

LVII. This Deluge of Waters was universal in its extent and effect; reaching to all the parts of the Earth, and destroying all the Land-animals on the intire Surface thereof; those only excepted which were with Noah in the Ark.

The following Texts, especially if compar'd with the thirty third foregoing Phænomenon, and added to Dr. Woodward's Observations attesting the same thing, will put this Assertion beyond rational Exception.

God looked upon the earth, and behold it was corrupt; for all flesh had corrupted his way upon the earth. And God said unto Noah, The end of all flesh is come before me.

Behold, I, even I do bring a flood of waters upon the earth, to destroy all flesh, wherein is the breath of life;

Vid. Philonis descriptionem Diluvii apud Burnetium, Archaeol. p. 236.

Essay, Pref. and Part 3. Sect. 2. Vid. Th. l. i. c. 3. Gen. vi. 13.

Vers. 14.

life from under heaven: and every thing that is in the earth shall dye.

Chap. vii.

4.

Verse 19,

20, 21,

22, 23.

Every living substance that I have made, will I destroy from off the face of the earth.

All the high hills that were under the whole heaven were covered. — And all flesh died that moved upon the earth, both of fowl, and of cattle, and of beast, and of every creeping thing that creepeth upon the earth, and every man. All in whose nostrils was the breath of life; all that was in the dry land died. And every living substance was destroyed which was upon the face of the ground, both man, and cattle, and the creeping thing, and the fowl of the heaven, and they were destroyed from the earth; and Noah only remain'd alive, and they that were with him in the Ark.

Vid. Va-
ren. Geog.
p. 60.

Gen. vii.
19, 20.

LVIII. The Waters at their utmost height were fifteen Cubits above the highest Mountains, or three Miles at the least perpendicular above the common Surface of the Plains and Seas.

All the high hills under the whole heaven were cover'd. Fifteen cubits upwards did the waters prevail, and the mountains were cover'd.

LIX. Whatever be the height of the Mountain *Caucasus*, whereon the *Ark* rested Now; it was at that time the highest in the whole World.

Vid. Hy-
poth. 8.
prius.

This is evident from what has been already observ'd, That tho' the utmost height of the Waters were fifteen Cubits above the highest Mountains, and so many hundreds, nay, thousands above the most of them; yet, did the Ark rest on the very first day on which the Waters began to diminish, more than two Months before the emerging of the tops of the other Mountains;

Mountains; As is evident from the Texts following.

The waters prevailed upon the earth (from the seventeenth day of the second, to the seventeenth day of the seventh month) an hundred and fifty days. And God remembred Noah, and all the cattel that was with him in the Ark; and God made a wind to pass over the earth, and the waters asswaged. The fountains also of the deep, and the windows of heaven were stopped, and the rain from heaven was restrained. And the waters returned from off the earth continually, and after the end of the hundred and fifty days the waters were abated. And the Ark rested in the seventh month, on the seventeenth day of the month, upon the mountains of Ararat. And the waters decreased continually until the tenth month: in the tenth month, on the first day of the month, were the tops of the mountains seen.

Gen. vii.
ult. (with
verse 11.)
Chap. viii.
1, 2, 3, 4,
5.

LX. As the Fountains of the great Deep were broken up at the very same time that the first Rains began, so were they stopp'd the very same time that the last Rains ended; on the seventeenth day of the seventh Month.

The fountains also of the deep, and the windows of heaven were stopped, and the rain from heaven was restrained.

Gen. viii.
2.

LXI. The abatement and decrease of the Waters of the Deluge was first by a Wind which dried up some. And secondly, by their descent through those Fissures, Chaps, and Breaches, (at which part of them had before ascended) into the Bowels of the Earth, which received the rest. To which latter also the Wind, by hurrying the Wa-

ters up and down, and so promoting their lighting into the beforemention'd Fissures, was very much subservient.

Gen. viii.

1.

God made a wind to pass over the earth, and the waters asswaged.

Verse 3.

The waters returned from off the earth continually, or going and returning.

Job

xxxviii. 8,

10, 11.

Who shut up the sea with doors, when it brake forth as if it had issued out of the womb?—When I brake up for it my decreed place, and set bars and doors, and said, Hitherto shalt thou come, but no further; and here shall thy proud waves be stayed.

Psal. civ.

6, 7, 8, 9.

Thou coverest the earth with the deep, as with a garment: the waters stood above the mountains. At thy rebuke they fled: at the voice of thy thunder they hasted away. They went up by the mountains: they went down by the vallies unto the place which thou hadst appointed for them. Thou hast set a bound that they may not pass, that they turn not again to cover the earth.

LXII. The dry Land, or habitable Part of the Globe, is since the Deluge divided into two vast *Continents*, almost opposite to one another, and separated by a great Ocean interpos'd between them.

This every Map of the Earth is a sufficient proof of.

LXIII. One of these *Continents* is considerably larger than the other.

This is evident the same way with the former.

LXIV. The larger *Continent* lies most part on the *North-side* of the Equator, and the smaller most part on the *South*.

This

This (if we take *South-America*, the most considerable and intire Branch of the whole, for the *Continent* here referr'd to, as 'tis reasonable to do) is also evident the same way with the former.

LXV. The Middle or Center of the *North-Continent* is about sixteen or eighteen degrees of *Northern Latitude*; and that of the *South* about sixteen or eighteen degrees of *Southern Latitude*.

This may soon be found by measuring the Boundaries of the several *Continents* on a Globe or Map, and observing the Position of their Centers.

LXVI. The distance between the *Continents*, measuring from the larger or *Northern South-Eastward*, is greater than that the contrary way, or *South-Westward*.

This is evident by the like means with the former: It being farther from *China*, or the *East-Indies* to *America* going forward *South-East*, than from *Europe* or *Africa* going thither *South-West*.

LXVII. Neither of the *Continents* is terminated by a round or even circular Circumference, but mighty Creeks, Bays, and Seas running into them; and as mighty Peninsula's, Promontories, and Rocks jetting out from them, render the whole very unequal and irregular.

This none who ever saw a Globe or Map of the World can be ignorant of.

LXVIII. The depth of that *Ocean* which separates these two *Continents* is usually greater

greatest farthest from, and least nearest to either of the same *Continents*; there being a gradual descent from the *Continents* to the middle of the *Ocean*, which is the deepest of all.

This is a Proposition very well-known in Navigation; and in several *Sea-Chart's* relating thereto, may easily be observ'd.

LXIX. The greatest part of the *Islands* of the Globe are situate at small distances from the Edges of the great *Continents*; very few appearing near the middle of the main *Ocean*.

This the bare Inspection into a Map or Globe of the World will soon give satisfaction in.

LXX. The Ages of Men decreas'd about one half presently after the Deluge; and in the succeeding eight hundred or nine hundred Years were gradually reduced to that standard at which they have stood ever since.

This

This the following Tables will easily evince.

Ages of the *Antediluvians* in their Years.

Adam	930
Seth	912
Enos	905
Cainan	910
Mabalaleel	895
Jared	962
Enoch (translated)	365
Methuselah	969
Lamech	777
Noah	950
Sem	600

Ages of the *Postdiluvians* in the present Years.

Noah	950
Sem	600
Arphaxad	438
Salah	433
Heber	464
Phaleg	239
Reu	239
Serug	230
Nabor	148
Terah	205
Abraham	175
Isaac	180
Jacob	147
Joseph	110

Gen. v. 11.
and xxv. 7.
and xxxv.
28. and
xlvii. 28.
and L. 26.

The days of our years are threescore years and ten; and if by reason of strength they be fourscore years, yet is their strength labour and sorrow: for it is soon cut off, and we fly away. In the Days of Moses.

Psal. xc.
10.

LXXI. Our upper Earth, for a considerable depth, even as far as we commonly penetrate into it, is *Factitious*, or newly acquir'd at the Deluge: The ancient one having been covered by fresh *Strata* or *Layers* of Earth at that time, and thereby spoil'd or destroy'd as to the use and advantage of Mankind.

I will destroy them with the Earth.

Gen. vi.

Neither shall there any more be a flood, *Διαφύξει*, to destroy, corrupt, or spoil the Earth.

13.
and ix.
11.

Essay.
Passim.

This is moreover evident by the vast numbers of the Shells of Fish, Bones of Animals, Intire or Partial Vegetables, buried at the Deluge, and Inclosed in the Bowels of the present Earth, and of its most solid and compacted Bodies, to be commonly seen at this day. Whose truth is attested not only by very many occasional remarks of others, but more especially by the careful and numerous Observations of an Eye-witness, the Learned Dr. Woodward. 'Tis true, this excellent Author was forc'd to imagine, and accordingly to assert, That the Ancient Earth was dissolv'd at the Deluge, and all its parts separated from one another; and so the whole, thus dissolv'd and separate, taken up into the Waters which then cover'd the Earth; till at last they together settled downward, and with the fore-mentioned Shells, Bones, and Vegetables, inclosed among the rest of the Mass, compos'd again that Earth on which we now live. But this *Hypothesis* is so strange, and so miraculous in all its parts; 'tis so wholly different from the natural *Series* of the *Mosaick* History of the Deluge; takes so little notice of the forty days rain, the principal cause thereof; is so contrary to the Universal Law of mutual Attraction, and the specifick gravities of Bodies; accounts for so few of the before-mention'd *Phænomena* of the Deluge; fixes the time of the year for its commencing so different from the truth; implies such a sort of new Formation or Creation of the Earth at the Deluge, without warrant for the same; is in some things so little consistent with the *Mosaick* Relation, and the *Phænomena* of nature; and upon the whole is so much more than his Observations require, that I cannot but dissent from this particular *Hypothesis*,

pothesis, tho' I so justly honour the *Author*, and so highly esteem, and frequently refer to the *Work* it self. All that I shall say farther is this, That the *Phænomena* of the interior Earth, by this *Author* so exactly observ'd, are on the common grounds or notions of the Deluge, (which suppose the Waters to have been pure, without any other mixtures) so unaccountable, and yet so remarkable and evident, that if no other rational solution could be offer'd, 'twere but just and necessary to admit whatever is asserted by this *Author*, rather than deny the reality of those *Phænomena*, or ascribe the plainest remains of the Animal and Vegetable Kingdom to the sportings of Nature, or any such odd and *Chimærical* occasions, as some persons are inclinable to do. But withal, I must be allow'd to say, and the *Author* himself will not disagree, That his *Hypothesis* includes things so strange, wonderful, and surprizing, that nothing but the utmost necessity, and the perfect unaccountableness of the *Phænomena* without it, ought to be esteem'd sufficient to justify the belief and introduction of it. Which straits that account of the Deluge we are now upon, not forcing me into, as will appear hereafter; I have, I think, but just reasons for my disbelief thereof, and as just, or rather the same reason to embrace that Assertion we are now upon, That this upper Earth, as far as any Shells, Bones, or Vegetables are found therein, was *adventitious*, and newly acquir'd at the Deluge, and not only the old one dissolv'd, and resettled in its ancient place again.

Essay, p.
82.

LXXII. This *Facitious Crust* is universal, upon the Tops of the generality of Mountains,

Mountains, as well as in the Plains and Valleys; and that in all the known Climates and Regions of the World.

Essay, p 5,
6, 7.

This is fully attested by the Observations of the same *Author*, and those which he procur'd from all parts of the World conspiring together.

LXXIII. The Parts of the present upper *Strata* were, at the time of the Waters covering the Earth, loose, separate, divided, and floated in the Waters among one another uncertainly.

Pref. and
p. 74.

This is proved by the same *Author's* Observations.

LXXIV. All this Heterogeneous Mass, thus floating in the Waters, by degrees descended downwards, and subsided to the bottom, pretty nearly, according to the Law of Specifick Gravity; and there compos'd those several *Strata* or *Layers*, of which our present upper Earth does consist.

p. 75.

This is prov'd by the same Observations.

LXXV. Vast multitudes of Fishes, belonging both to the Seas and Rivers, perish'd at the Deluge; and their Shells were buried among the other Bodies or Masses which subsided down, and compos'd the *Layers* of our upper Earth.

p. 75, 76,
77.

This is prov'd by the same Observations.

LXXVI. The same Law of Specifick Gravity which was observ'd in the rest of the Mass, was also observ'd in the subsidence of the Shells of Fishes; they then sinking together with, and accordingly being

ing now found enclos'd among those *Strata* or Bodies which are nearly of their own several Specifick Gravities: The heavier Shells being consequently still enclos'd among the heavier *Strata*, and the lighter Shells among the lighter *Strata*, in the Bowels of our present Earth.

This is prov'd by the same Observations.

P. 75, 76,

LXXVII. The *Strata* of *Marble*, of *Stone*, and of all other solid Bodies, attained their solidity as soon as the *Sand*, or other matter whereof they consist, was arriv'd at the bottom, and well settled there. And all those *Strata* which are solid at this day, have been so ever since that time.

77.

This is prov'd by the same Observations.

P. 79.

LXXVIII. These *Strata* of *Stone*, of *Chalk*, of *Cole*, of *Earth*, or whatever matter they consisted of, lying thus each upon other, appear now as if they had at first been parallel, continued, and not interrupted: But as if, after some time they had been dislocated and broken on all sides of the Globe, had been elevated in some, and depress'd in other places; from whence the fissures and breaches, the Caverns and *Grotto's*, with many other irregularities within and upon our present Earth, seem to be deriv'd.

This is prov'd by the same Observations.

P. 79, 80,
81.

LXXIX. Great numbers of Trees, and of other Vegetables were also, at this subsidence of the Mass aforesaid, buried in the Bowels

Bowels of the Earth: And such very often as will not grow in the places where they are lodg'd: Many of which are pretty intire and perfect, and to be distinctly seen and consider'd to this very day.

P. 77, 78.

This is prov'd by the same Observations.

113.

LXXX. It appears from all the tokens and circumstances which are still observable about them, That all these Vegetables were torn away from their ancient Seats in the Spring time, in or about the Month of May.

P. 274,

This is prov'd by the same Observations.

275.

LXXXI. All the *Metals* and *Minerals* among the *Strata* of our upper Earth owe their present frame and order to the Deluge; being repos'd therein during the time of the Waters covering the Earth, or during the subsidence of the before-mention'd Mass.

P. 179,

This is prov'd by the same Observations.

180.

LXXXII. These *Metals* and *Minerals* appear differently in the Earth, according to the different manner of their first lodgment: For sometimes they are in loose and small Particles, uncertainly inclos'd among such Masses as they chanc'd to fall down withal: At other times some of their Corpuscles happening to occur and meet together, affix'd to each other; and several convening, uniting, and combining into one Mass, form'd those *Metallick* and *Mineral Balls* or *Nodules* which are now found in the Earth: And according as the Corpuscles chanc'd

to be all of a kind or otherwise, so the Masses were more or less simple, pure, and homogeneous. And according as other Bodies, Bones, Teeth, Shells of Fish, or the like happen'd to come in their way, these *Metallick* and *Mineral* Corpuscles affix'd to and became conjoin'd with them; either within, where it was possible, in their hollows and interstices; or without, on their surface and outsides, filling the one, or covering the other: And all this in different degrees and proportions, according to the different circumstances of each individual case.

All this is prov'd by the same Observations.

P. 179,
&c.

LXXXIII. The inward parts of the present Earth are very irregular and confused. One Region is chiefly *Stony*, another *Sandy*, a third *Gravelly*. One Country contains some certain kinds of *Metals* or *Minerals*, another quite different ones. Nay the same lump or mass of Earth not seldom contains the Corpuscles of several *Metals* or *Minerals*, confusedly intermix'd with one another, and with its own Earthy parts. All which irregularities, with several others that might be observ'd, even contrary to the Law of Specifick Gravity in the placing of the different *Strata* of the Earth, demonstrate the Original *Fund* or *Promptuary* of all this upper Factitious Earth to have been in a very Wild, Confus'd and *Chaotick* condition.

All

Essay, passim & p. 170, &c. Varen. Geog. l. 1. c. 7. prop. 7.

All this the fore-mention'd, and all other Observations of the like nature fully prove.

LXXXIV. The Uppermost and Lightest *Stratum* of Soil or *Garden Mold*, as 'tis call'd; which is the proper Seminary of the Vegetable Kingdom; is since the Deluge very thick spread usually in the Valleys and Plains, but very thin on the Ridges or Tops of Mountains: Which last for want thereof are frequently Stony, Rocky, Bare and Barren.

This, easie Observations of the surface of the Earth in different places will quickly satisfy us of.

LXXXV. Of the four Ancient Rivers of Paradise two still remain, in some measure; but the other two do not; or at least are so chang'd, that the *Mosaick* Description does not agree to them at present.

Gen. ii. 10, 11, 12, 13, 14.

This the multitude of unsatisfactory attempts to discover all these Rivers, and their courses; with an impartial comparison of the Sacred History with the best Geographical descriptions of the Regions about *Babylon*, will easily convince an unbiass'd Person of.

Gen. ii. 10, 11, 12, 13, 14. Ezek. xxviii. 12. Apoc. xxi. 18, 19, 20. with xxii. 2.

LXXXVI. Those *Metals* and *Minerals* which the *Mosaick* description of Paradise, and its bordering Regions takes such particular notice of, and the Prophets so emphatically refer to, are not now met with so plentifully therein.

This must be allow'd on the same grounds with the former.

LXXXVII. This Deluge of Waters was

a signal Instance of the Divine Vengeance on a Wicked World; and was the effect of the Peculiar and Extraordinary Providence of God.

God saw that the wickedness of man was great in the earth, and that every imagination of the thoughts of his heart was only evil continually. And it repented the Lord that he had made man on the Earth, and it grieved him at his heart. And the Lord said, I will destroy man whom I have created from the face of the earth; both man, and beast, and the creeping thing, and the fowls of the air; for it repenteth me that I have made them. Gen. vi. 5, 6, 7.

The earth was corrupt before God, and the earth was filled with violence, and God looked upon the earth, and behold it was corrupt; for all flesh had corrupted his way upon the Earth. And God said unto Noah, the end of all flesh is come before me, for the earth is filled with violence through them; and behold I will destroy them, with the earth. Ver. 11, 12, 13.

Behold I, even I, do bring a flood of waters upon the earth, to destroy all flesh wherein is the breath of life from under heaven; and every thing that is in the earth shall dye. Ver. 17.

God spared not the old world, but saved Noah, the eighth person, a preacher of righteousness; bringing in the flood upon the world of the ungodly. 2 Pet. ii. 5.

LXXXVIII. Tho' the Moon might perhaps undergo some such changes at the Deluge as the Earth did, yet that Face or Hemisphere which is towards the Earth, and which is alone expos'd to our view, has not acquir'd any such gross Atmosphere, or Clouds, as our Earth has now about it, and which are here suppos'd to have been acquir'd at the Deluge.

This

This the present figure, and large divisions of Sea and Land visible in the Moon, with her continued and uninterrupted brightness, and the appearance of the same Spots, (without the interposition of Clouds or Exhalations) perpetually, do sufficiently evince.

LXXXIX. Since the Deluge there neither has been, nor will be, any great and general Changes in the state of the World, till that time when a Period is to be put to the present Course of Nature.

Gen. viii.
21, 22.

The Lord smelled a sweet savour, and the Lord said in his heart, I will not again curse the ground any more for man's sake; for (or altho') the imagination of man's heart is evil from his youth: Neither will I again smite any more every thing living as I have done. While the Earth remaineth, seed-time and harvest, and cold and heat, and Summer and winter, and day and night shall not cease.

Essay, par.
1, & 54

And this as to the time past is abundantly confirm'd by all the Ancient History and Geography compar'd with the Modern; as is in several particulars well observ'd by Dr. Woodward, against the groundless opinions of some others to the contrary.

CHAP. V.

Phænomena relating to the General Conflagration. With Conjectures pertaining to the same, and to the succeeding period till the Consummation of all things.

XC. **A**S the World once perished by Water, so it must by Fire at the Conclusion of its present State.

The heavens and the earth which are now, by the word of God, are kept in store, reserved unto fire, against the day of judgment, and perdition of ungodly men. 1 Pet. iii. 7.

The heavens shall pass away with a great noise, and the elements shall melt with fervent heat; The earth also, and the works that are therein, shall be burnt up. Verse 10.

In the day of God the heavens, being on fire, shall be dissolved, and the elements shall melt with fervent heat. Verse 12.

But this is so fully attested by the unanimous consent of Sacred and Prophane Authority, that I shall omit other particular Quotations; and only refer the Reader where he may have more ample satisfaction.

Dr. Hackett's Apology of the Power and Providence of God. l. 4. c. 13. Theor. l. 3. c. 3.

SCHOLIUM.

Having proceeded thus far upon more certain grounds, and generally allow'd Testimonies, as to the most of the foregoing *Phænomena*; I

X

might

might here break off, and leave the following *Conjectures* to the same state of Uncertainty they have hitherto been in. But being willing to comply with the Title, and take in all the great and general Changes from first to last; from the primigenial *Chaos*, to the *Consummation* of all things: Being also loth to desert my *Postulatum*, and omit the account of those things which were most exactly agreeable to the Obvious and Literal sense of Scripture, and fully consonant to Reason and Philosophy: Being, lastly, willing however to demonstrate, that tho' these most remote and difficult Texts be taken according to the greatest strictness of the Letter, yet do they contain nothing but what is possible, credible, and rationally accountable from the most undoubted Principles of Philosophy: On all these accounts I shall venture to enumerate, and afterward to account for the following *Conjectures*. In which I do not pretend to be Dogmatical and Positive; nay, nor to declare any firm belief of the same, but shall only propose them as *Conjectures*, and leave them to the free and impartial consideration of the Reader.

XCI. The same Causes which will set the World on Fire, will also cause great and dreadful *Tides* in the *Seas*, and in the *Ocean*; with no less Agitations, Concussions, and *Earthquakes* in the *Air* and *Earth*.

Mat. xxiv.

29.

Joel. iii.

16.

Luk. xxi.

25, 26.

Vid.

Theor. l. 3.

c. 11.

The Powers of Heaven shall be shaken.

The Lord shall roar out of Sion, and utter his voice from Jerusalem, and the heavens and the earth shall shake.

The sea and the waves roaring: Men's hearts failing them for fear, and for looking after those things which are coming on the Earth; for the powers of heaven shall be shaken.

XCII.

XCII. The *atmosphere* of the Earth, before the Conflagration begin, will be oppress'd with *Meteors, Exhalations, and Steams*; and these in so dreadful a manner, in such prodigious quantities, and with such wild confused Motions and Agitations, That the *Sun and Moon* will have the most frightful and hideous countenances, and their antient splendour will be intirely obscur'd; The *Stars* will seem to fall from Heaven; and all manner of Horrid Representations will terrifie the Inhabitants of the Earth.

I will shew wonders in the heavens and in the earth; blood, and fire, and pillars of smoke. The sun shall be turned into darkness, and the moon into blood, before the great and terrible day of the Lord come. Joel ii. 30, 31.

The sun shall be darkened, and the Moon shall not give her light, and the stars shall fall from heaven, and the powers of heaven shall be shaken. Mat xxiv. 29.

There shall be signs in the sun, and in the moon, and in the stars, and upon the Earth distress of Nations, with perplexity: — Mens hearts failing them for fear, and for looking after those things which are coming on the earth. Luk. xxi. 25, 26.

XCIII. The *Deluge and Conflagration* are referr'd, by ancient Tradition, to great Conjunctions of the Heavenly Bodies; as both depending on, and happening at the same.

Thus *Seneca* expressly: *Berosus* (says he) who was an Expositor of *Belus*, affirms, That these *Revolutions* depend on the Course of the *Stars*; insomuch that he doubts not to assign the very times of a *Conflagration*, and a *Deluge*: That first mention'd when all

Nat. Quæst. I. 3. c. 29.

the Stars, which have now so different Courses, shall be in Conjunction in Cancer: All of them being so directly situate with respect to one another, that the same right line will pass through them all together: That last mention'd when the same company of Stars shall be in conjunction in the opposite sign Capricorn.

XCIV. The space between the *Deluge* and the *Conflagration*, or between the ancient state of the Earth, and its Purgation by Fire, Renovation, and Restitution again, is, from ancient Tradition, defin'd and terminated by a certain great and remarkable year, or *Annual Revolution* of some of the Heavenly Bodies: And is in probability what the Ancients so often refer'd to, pretended particularly to determine, and stil'd The Great or *Platonick Year*.

Theor. I.
3. C. 4.

This year is exceeding famous in old Authors; and not unreasonably apply'd to this matter by the *Theorist*: Which it will better suit in *this* than it did in *that Hypothesis*.

XCV. This general *Conflagration* is not to extend to the intire dissolution or destruction of the Earth, but only to the Alteration, Melioration, and peculiar disposition thereof into a new state, proper to receive those Saints and Martyrs for its Inhabitants, who are at the first Resurrection to enter, and to live and reign a thousand years upon it, till the second Resurrection, the general Judgment, and the final consummation of all things.

The Heavens being on fire shall be dissolved, and the elements shall melt with fervent heat. Nevertheless we, according to his promise, look for new heavens, and a new earth, wherein dwelleth Righteousness. 2 Pet. iii. 12, 13.

Behold, I create new heavens, and a new earth, and the former shall not be remembered nor come into mind. Isa. lxi. 17.

Verily I say unto you, That ye which followed me, in the regeneration, when the Son of Man shall sit upon the throne of his glory, ye also shall sit on twelve thrones judging the twelve tribes of Israel. And every one that hath forsaken houses, or brethren, or sisters, or father, or mother, or wife, or children, or lands for my names sake, shall receive an hundred fold, now in this time, houses, and brethren, and sisters, and mothers, and children, and lands, with (his present) persecutions, and in the world to come eternal life. Mat. xix. 28, 29. Mat. x 29. 30. Luke xviii 29, 30.

Of old thou hast laid the foundations of the earth; and the heavens are the work of thy hand: They shall perish, but thou shalt endure; yea all of them shall wax old like a garment; as a vesture shalt thou change them, and they shall be changed. Ps. cii. 25, 26.

I saw thrones, and they sat upon them; and judgment was given unto them: And I saw the Souls of them that were beheaded for the witness of Jesus, and for the word of God, and which had not worshipped the beast, neither his image, neither had received his mark upon their foreheads, or in their hands, and they lived and reigned with Christ a thousand years. But the rest of the dead lived not again until the thousand years were finished: This is the first resurrection. Blessed and holy is he that hath part in the first resurrection; on such the second death hath no power: But they shall be priests of God, and of Christ; and shall reign with him a thousand years, &c. Apoc. xx. 4, &c.

Theor. 14.
c. 2, 3, 4,
5, 9.

But so much has been said on this head, to omit others, by the *Theorist*, that I shall refer the Reader thither, for the other Testimonies of the Holy Scriptures, and the unanimous consent of the most Primitive Fathers: Both which he at large, and to excellent purpose, (some particulars excepted) has insisted on.

XCVI. The state of Nature during the *Millennium* will be very different from that at present, and more agreeable to the *Antediluvian*, *Primitive*, and *Paradisiacal* ones.

Acts iii.
21.

Whom the heavens must receive until the time of the restitution of all things, which God hath spoken by the mouth of all his holy Prophets since the world began. See more in the Theory. Book 4. Chap. 9. and in the proofs of the former Proposition.

XCVII. The Earth in the *Millennium* will be without a Sea, or any large receptacle fill'd with mighty collections and quantities of Waters.

Apoc. xxi.
1.

I saw a new heaven, and a new earth; for the first heaven, and the first earth were passed away, and there was no more sea.

XCVIII. The Earth in the *Millennium* will have no succession of Light and Darkness, Day and Night; but a perpetual Day.

Apoc. xxi.
25.

The gates of the new Jerusalem shall not be shut at all by day; for there shall be no night there.

Cap. xxii.
5.

And there shall be no night there.

XCIX. The state of the *Millennium* will not stand in need of, and so probably will be without, the light and presence of the Sun and Moon.

And

And the City had no need of the Sun, neither of the Moon to shine in it. Apoc. xxi. 23.

And they need no candle; neither light of the sun. Cap. xxii. 5.

C. At the conclusion of the *Millennium*, the Final *Judgment* and *Consummation* of all things, The Earth will desert its present Seat and Station in the World, and be no longer found among the Planetary *Chorus*.

I saw a great white throne, and him that sat on it; from whose face the earth and the heavens fled away, and there was found no place for them. Apoc. xx. 11. Theor. I 4. c. 10.

BOOK IV.

SOLUTIONS:

OR,

An Account of the foregoing *Phænomena* from the Principles of Philosophy already laid down.

CHAP. I.

A Solution of the Phænomena relating to the Molaick Creation, and the original Constitution of the Earth.

I. All those particular small Bodies of which our habitable Earth is now compos'd, were originally in a mixed, confused, fluid, and uncertain Condition; without any order or regularity. It was an *Earth without form, and void*; had *darkness* spread over the face of its *Abyss*; and in reality was, what it has been ever stil'd, A perfect *Chaos*.

I. **T**HIS has been already sufficiently accounted for, and need not be here again insisted on. *Hypoth. 1. prius.*

II. The Formation of this Earth, or the Change of that *Chaos* into an habitable World, was not a meer result from

from any necessary Laws of *Mechanism* independently on the Divine Power; but was the proper effect of the Influence and Interposition, and all along under the peculiar Care and Providence of God.

Vid. *Lem.*
9. *cum* Co-
roll. *prius.*
And *Bent-*
ley, *Serm.*
7. p. 26,
&c.

II. 'Tis not very easy, I confess, in such mighty Turns and Changes of the World, exactly to determine how far, and in what particulars, a supernatural or miraculous Interposition of the Divine Power is concern'd; and how far the Laws of Nature, or Mechanical Powers ought to be extended. Nay, indeed, 'tis difficult enough, in several instances, to determine what is the effect of a natural and ordinary, and what of a supernatural and extraordinary Providence. 'Tis now evident, That *Gravity*, the most mechanical Affection of Bodies, and which seems most natural, depends entirely on the constant and efficacious, and, if you will, the supernatural and miraculous Influence of Almighty God. And I do not know whether the falling of a Stone to the Earth ought not more truly to be esteem'd a *supernatural Effect*, or a *Miracle*, than what we with the greatest surprize should so stile, its remaining pendulous in the open Air; since the former requires an *active Influence* in the first Cause, while the latter supposes *Non-annihilation* only. But besides this, Tho' we were able exactly to distinguish in general the ordinary Concurrence of God from his extraordinary, yet would the task before us be still sufficiently difficult. For those Events or Actions are in Holy Scripture attributed immediately to the Power and Providence of God, which yet were to all outward appearance according to the constant course of things, and would, abstractedly from such Affirmations of the Holy Books, have been esteem'd no more miraculous than
the

the other common Effects of Nature, or usual Accidents of Humane Affairs; as those who have carefully consider'd these matters, especially the Historical and Prophetical Parts of the *Old Testament* must be oblig'd to confess. Neither is it unreasonable that all things should in that manner be ascribed to the Supream Being on several accounts. 'Tis from him every thing is ultimately deriv'd: He conserves the Natures, and continues the Powers of every Creature: He not only at first produc'd, but perpetually disposes and makes use of the whole Creation, and every part thereof, as the Instruments of his Providence: He foresaw and foreadapted the intire Frame: He determin'd his Co-operation or Permission to every Action: He so order'd and appointed the whole System with every individual Branch of it, as to Time, Place, Proportion, and all other Circumstances, that nothing should happen unseasonably, unfitly, disproportionately, or otherwise than the Junctures of Affairs, the demerits of his reasonable Creatures, and the wise Intentions of his Providence did require. In fine, he so previously adjusted and contemper'd the Moral and Natural World to one another, that the Marks and Tokens of his Providence should be in all Ages legible and conspicuous, whatsoever the visible secondary Causes or Occasions might be. Seeing then this is the true state of the Case; and that consequently, Almighty God has so constituted the World that no Body can tell wherein it differs from one, where all were solely brought to pass by a miraculous Power; 'tis by no means untrue or improper in the Holy Books to refer all those things which bare Humane Authors would derive from second Causes, the constant Course of Nature,
and

and the Circumstances of Humane Affairs to the first Cause, the ultimate Spring and Original of all; and to call Mens Thoughts (which are too apt to terminate there) from the apparent occasions, to the invisible God the Creator, Governor, and Disposer of the whole, and the sole Object of their Regard and Adoration. This is, I say, a very proper and reasonable procedure; this is usually observ'd by the Sacred Penmen, (who are thereby peculiarly distinguish'd from Prophane Authors) and this is of the highest advantage in Morality. But then it must be withal acknowledg'd, That this creates great difficulties in the present Case, and makes it very hard in a Philosophick Attempt of this nature, to distinguish between those parts of the *Mosaick* Creation, which are *Mechanically* to be accounted for, and those in which the miraculous *Energy* of God Almighty interpos'd it self; which yet, if ever, is certainly to be allow'd in this case, where a new World was to be form'd, and a wild *Chaos* reduc'd into a regular, beautiful, and permanent System. This being said in general, to bespeak the *Reader's* Candor in the present Case, and to forewarn him not to fear the most Mechanical and Philosophick Account of this Creation, as if thereby the Holy Scriptures were superseded, or the Divine Power and Providence excluded; I come directly to the Point before us, and shall endeavour to determine what are the Instances of the extraordinary Power and Interposition of God in this whole Affair. That as we shall presently see how Orderly, Methodical, and Regular this Formation was, so we may before-hand be duly sensible how Supernatural, Providential, and Divine it was also; and so as well, like Christians, contem-
plate

plate and adore the Omnipotent Creator in his *Miraculous*, as we, like Philosophers, shall attempt to consider and remark his Vicegerent Nature in her *Mechanical* Operations therein. For, notwithstanding what has been above insisted on touching the frequency and propriety of ascribing the Effects of Nature to the Divine Power (the former being indeed nothing, but the latter acting according to fixt and certain Laws); yet, because more has been commonly, and may justly be suppos'd the importance of the Texts of Scripture hereto relating; because the Finger of God, or his supernatural Efficiency, is if ever to be reasonably expected in the Origin of Things, and that in a peculiar and remarkable manner; because some things done in this Creation are beyond the power of Philosophy and Mechanism, and no otherwise accountable but by the Infinite Power of God himself; because the days of Creation are signally distinguish'd from those following, in which God is said to have rested (when yet his ordinary Concurrence, and the Course of Nature was continued without Interruption), and must therefore be reckon'd such, on which he truly exerted a Power different from the other. On all these accounts, I freely, and in earnest allow and believe, That there was a peculiar Power, and extraordinary Providence exercis'd by the great Creator of all, in this Primitive Origin of the Sublunary World, or Formation of the Earth which we are going to account for. The particular instances I shall give of the same, without presuming to exclude all others, are these following,

1. The

Discourse,
p. 4, 5, 7.
Gen. i. 1.

Vid. Bentley,
Serm.
6.

1. The Creation of the matter of the Universe, and particularly of that of the Earth, out of nothing, was without doubt originally the alone and immediate Work of God Almighty. Nature (let what will be meant by that Name) could have no hand in this, from whence at the utmost she can but date her own Birth. The production of a real Being out of nothing, or to speak more properly, the primary bringing any real thing into Being, is in the Opinion of all Men; the Effect of no less than an Infinite and Omnipotent Deity. I have already owned this to be the import of the first words of this Creation we are now upon, *In the beginning God created the Heaven and the Earth.* And I think 'tis here no improper place to declare my Opinion; That considering the *Idea* and Nature of God includes *Active Power*, *Infinite Perfection*, with *Necessity* and so *Eternity of Existence*; when the *Idea* and Nature of matter supposes *intire Inactivity*, *no positive Perfection*, and a *bare Possibility or Capacity of Existence*; 'tis as absurd and unreasonable to attribute Eternity and Necessity of Existence to the latter, as 'tis rational and natural to ascribe those Perfections, with a Power of Creation, to the former. The very *Being* and *Nature*, as well as the *Properties* and *Powers* of Matter being most justly and most philosophically to be refer'd to the Author of all, the Almighty Creator. And altho' our imagination (a poor, finite, limited, and imperfect Faculty) be unable to have a positive *Idea* of the manner of the Production of a real Being at first (as indeed 'twere sufficiently strange, if so confin'd a Power of so imperfect a Creature should adequately reach the highest point of Omnipotence it self); yet seeing the Absurdities following the Eternity, and Self-

Self-subsistence of Matter on the other side are so enormous; and the certainty of the proper Creation of Spiritual Beings nobler than Matter, such as the Souls of Men are, as great, as 'tis utterly incredible they should have been *ab æterno* too (for I take it to be demonstrable that Souls are immaterial:) I think 'tis far more reasonable to rest satisfied with our former Assertion, That God did truly bring Matter into being at first, than its Eternity suppos'd, to make only the Modification and Management thereof the Province of the Almighty: And consequently the first instance of a Divine Efficiency with relation to the Subject we are now upon, and the highest of all other, was the original Production of the Matter of which the Earth was to consist, or the proper Creation of those inferior Heavens, and of that Earth which were to be the sole Object of the Divine Operations in the six days Work. This particular, I confess, does not so properly belong to our present business, the Formation of the *Chaos* into a habitable World; but could not well be omitted, either consider'd in it self, as it bears so peculiar a Relation to our present purpose; or with respect to that misconstruction I might with some *Readers* have otherwise been liable to. But I proceed;

2. The changing of the Course and Orbit of the *Chaos* into that of a Planet (to omit the former *Annual*, and subsequent *Diurnal* Revolutions, which tho' equally from God, yet do not so fully belong to this place), or the placing of the Earth in its primitive *Circular* Orbit at its proper distance, therein to revolve about the *Sun*, was either an instance of the immediate Power, or at least of the peculiar Providence of God.

God. For if, we should suppose, as 'tis possible to do, that God did not by a miraculous Operation remove the *Chaos* or Comet from its very Eccentric *Ellipsis* to that Circle in which it now began to revolve; but that he made use of the Attraction or Impulse of some other Body; yet in this case, (without considering that one of those Powers at least is nothing but a Divine Energy,) the Lines of each Bodies motion, the quantity of force, the proper distance from the *Sun* where, and the exact time when it happen'd (to name no other particulars here) must have been so precisely and nicely adjusted before-hand by the Prescience and Providence of the Almighty, that here will be not a much less remarkable Demonstration of the *Wisdom, Contrivance, Care, and Goodness*, than the other immediate Operation would have been of the *Power* of God in the World.

(3.) The Formation of the Seeds of all Animals and Vegetables was originally, I suppose the immediate Workmanship of God. As far as our Micrometers can help us to discern the Make and Constitution of Seeds; those of Plants evidently, and by what hitherto appears of Animals too, are no other than the intire Bodies themselves *in parvo*, and contain every one of the same Parts and Members with the compleat Bodies themselves when grown to maturity. When therefore, consequently, all *Generation* is with us nothing, as far as we can find, but *Nutrition* or *Augmentation of Parts*; and that agreeably thereto no Seed has been by any Creature produc'd since the beginning of things: 'Tis very Just, and very Philosophical to conclude them to have been originally every one created by God, either out of nothing in the primary Existence

Vid. *Bentley*, Sermon.

4.

Existence of things; or out of præexisting Matter, at the *Mosaick* Creation. And indeed since the Origin of Seeds appears to be hitherto unaccountable by the mechanical Laws of Matter and Motion, 'tis but reasonable to suppose them the immediate work of the Author of Nature: which therefore I think the wariest Philosopher may well do in the present case.

(4.) The Natures, Conditions, Rules and Quantities, of those several Motions and Powers according to which all Bodies (of the same general nature in themselves) are specif'd, distinguish'd, and fitted for their several uses, were no otherwise determin'd than by the immediate *Fiat*, Command, Power, and Efficiency of Almighty God. 'Tis to be here consider'd, That tho' the Power of mutual Attraction or Gravitation of Bodies appears to be constant, and universal; nay almost essential to Matter in the present constitution of the world; (the intire Frame of that System in which we are, if not of all the other Systems, so strictly depending thereon) yet the other Laws of Nature, on which the particular qualities of Bodies depend, seems not to be so; but mutable in themselves, and actually chang'd according to the changes in the figure, bigness, texture, or other conditions of the Bodies or Corpuscles with which they are concern'd. Thus the *Cohæsion* of the parts of Matter, and that in some with less, but in others with the greatest and most surprising firmness; the *Fermentation* of several heterogeneous Particles, when mixt together; the

*Utinam cetera Naturæ
Phænomena ex principiis
mechanicis eodem argu-
mentandi genere derivare
liceret. Nam multa in-
veniunt ut nonnihil suspi-
cer ea omnia ex viribus
quibusdam pendere posse,
quibus corporum particu-
la, per causas nondum cog-
nitas, vel in se mutuo
impelluntur, & secundum
figuras regulares cohe-
rent, vel ab invicem su-
gantur, & recedunt: qui-
bus viribus ignotis, Phi-
losophi hætenus naturam
frustra tentarunt. Newton.
Præf. ad Lector.*

Magnetism of the Loadstone, with the various and very strange *Phænomena* of that wonderful Fossil; the *Elasticity* of certain Fluids and Solids; the contrary obstinate inflexibility and resistance of others; the different *Density* of several collections or masses of Fluids, (while yet the greatest part of their contained space is Vacuity) not to be considerably increas'd or diminish'd, without the destruction of the *species*: All these, and many other *Phænomena* shew, That there are various Rules and Laws of Matter and Motion not belonging to all, as that of Gravitation does, but peculiar to some particular conditions thereof; which therefore may be chang'd, without any damage to the Law of Gravity. In the impressing and ordering of which there is room for, if not a necessity of, introducing the particular and immediate efficacy of the Spirit of God at first, as well as of his continual concurrence and conservation ever since; When therefore, in a full agreement with the ancient Traditions, 'tis said by *Moses*, That *the Spirit of God moved on the face of the waters*. We may justly understand thereby his impressing, exciting, or producing such Motions, Agitations, and Fermentations of the several Parts; such particular Powers of Attraction or Avoidance (besides the general one of Gravity) of Concord or Enmity, of Union or Separation; and all these in such certain Quantities; on such certain Conditions of Bodies, and in such certain distinct Parts and Regions of the *Chaos*, as were proper and necessary for that particular Course and Disposition of Nature which it seem'd good to the Divine Spirit to introduce, and on which this future frame of things here below was ever after to depend.

Gen. i. 2.
Vid. Loca
de Chaos
prius lau-
data.

(5.) The

(5.) The Ordering of all things so that in the space of six successive Solar Revolutions the whole Creation should be finish'd, and each distinct Day's work should be confin'd to, and compleated in its own distinct and proper period, is also to be ascrib'd to the particular Providence and Interposition of God. That every thing followed in its own order and place: As that the Seeds of Vegetables on the Third, those of Fish and Fowl on the Fifth, and those of the Terrestrial Animals on the Sixth Day, should be every one plac'd in their proper Soil, and fitly dispos'd at their proper time to accompany and correspond with the suitable disposition of external Nature, and just then to germinate and fructify, when the order and process of the other parts of the Creation were ready for, and required the same. Every thing here does so suit together, that the plain footsteps of particular Art and Contrivance are visible in the whole conduct and management of this matter: Which therefore is not to be deriv'd from meer Mechanical Laws of Brute Matter, but from a Supernatural and Divine Providence.

(6.) But principally, The Creation of our First Parents is to be esteem'd the peculiar Operation of the Almighty; and that whether we regard the Formation of their Bodies, or the Forepast Creation and After-Infusion of their Souls. 'Tis Evident from the *Mosaick* History of the Creation, that Our First Parents were on the very same Day in which they were made, in a State of Maturity and Perfection, and capable of all Humane Actions, both of Mind and Body. Now if they, like the other Animals, had been produc'd in the usual Time and Process of Generation, and come to ripeness of Age and Facul-

ties by degrees afterwards ; That were plainly impossible. This Creation therefore must have been peculiar, and the immediate Effect of a Divine Power. And this is no less agreeable to Philosophy, than suitable to the Dignity of the Subject, and for the Honour of Mankind. It has been already observ'd that the Seeds of Plants and Animals must be allow'd to have been all the immediate Workmanship of God ; and that they contain every individual Part or Member of the intire Bodies, *in parvo* ; and that by consequence Generation is nothing else but Nutrition or Augmentation. Since therefore God by his immediate Power, Created the intire Bodies of all Plants and Animals, 'tis by no means hard to conceive that he might Create them in what degree of Maturity and Perfection he pleas'd, without any manner of infringement of the Order of Nature then to be establish'd : And if we have reason to believe, that the Bodies of bruit Creatures were created *in parvo*, in a small State, such as we now call Seeds, and so requir'd a proper Generation, *i. e.* Nutrition and Augmentation of parts (as the *Mosaick* History plainly describes them ; and had it not done so, we could not with any certainty have asserted it) ; We have sure equal reason to believe, from the description of the same Author in this other case, that the Bodies of our First Parents were Originally created in their Mature Bulk, and State of Manhood, so as immediately to be capable of the same Operations which at any time afterward they might be thought to be. This Miraculous Origination of the Bodies of our First Parents is therefore very rationally ascribed to the Finger of God by *Moses* : And we may justly believe that the Blessed Trinity, as 'tis represented in the Sacred

cred History, was peculiarly concern'd in the Production of that Being which was to bear the Image of God, and be made capable of some degree of his Immortality. And then as to the Soul of Man, 'tis certainly a very distinct Being from, and one very much advanced above the Body; and therefore if we were forc'd to introduce a Divine Power in the Formation of the latter, we can do no less than that in the Creation and Infusion of the former. And indeed the Dignity and Faculties of the Human Soul are so vastly exalted above all the Material, or merely Animal Creation, that its Original must be deriv'd from the immediate Finger of God in a manner still more peculiar and Divine than all the rest. That nearer resemblance of the Spiritual Nature, Immortal Condition, Active Powers, and Free, Rational, and Moral Operations of the Divine Being it self, which the Souls of men were to bear about them, did but require some peculiar and extraordinary Conduct in their first Existence, after-Union with Matter, and Introduction into the Corporeal World. Agreeably whereto we may easily observe a signal distinction in the Sacred History, between the formation of all other Animals, and the Creation of Man. In the former case 'tis only said, *Let the waters bring forth the moving creature that hath life. Let the earth bring forth the living creature after his kind.* But of the latter the entire Trinity consult: *And God said, Let Us make man in our image, after our likeness. And the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul.* As therefore the several parts of the *Mosaick* Creation before-mention'd are not to be mechanically attempted, but look'd upon as the effects of the Extraordi-

Gen. i. 20.

Verse 24.

Verse 26.

Chap. iii. 7.

nary and Miraculous Power and Providence of God, so more especially the Formation of the Body of Man in its mature state, and most of all the primary Creation and after-Infusion of the Rational Human Soul, is to be wholly ascrib'd to the same wonderful Interposition and Efficiency of the Supreme Being, the Creator of all things, *God blessed for evermore.* All which taken together and duly considered, is, I think, a sufficient and satisfactory Account of the Proposition before us, and attributes as much to the Miraculous and Immediate Hand of God, as either Tradition, Reason, or Scripture, require in the present Case.

III. The Days of Creation, and that of Rest, had their beginning in the Evening.

III. This has been already accounted for, and need not here be repeated.

Coroll. 1.
Lem. 70.
& Hypoth.
5. cum Coroll. 1. pri-
us.

Corollary 1. *This Phenomenon in some measure confirms our Hypothesis, that the Primitive Days of the World were Years also. For otherwise the space of one single short Night seems too inconsiderable to have been taken such notice of in this History; and then, and ever after, made the first half of the Natural Day. But if it were equal to half a Year, it was too considerable to be omitted, and its memory was very justly preserv'd in succeeding Ages.*

Corollary 2. *We may here begin to take notice of the Regularity and Methodicalness of this History of the Creation: Which, tho' it principally intends the giving an account of the Visible Parts of the World, and how the state of Nature in each Period appeared in the Day time; yet Omits not the foregoing Night: which is very Mechanical and Natural. For in the preceding Night*

Night all things were so prepar'd and dispos'd, that the Work of each Day might, upon its appearance, display it self; might be exhibited, not in its unseen beginnings, or secret Workings, not in its previous Causes, and gradual Procedure, (which was not the Design of this History) but in that more distinct and perfect condition in which things would in the Day time appear to the view of a Spectator, and under which chiefly they were to be described and recorded in this History.

IV. At the time immediately preceding the Six Days Creation, the Face of the Abyss, or superior Regions of the *Chaos*, were involv'd in a Thick Darkness.

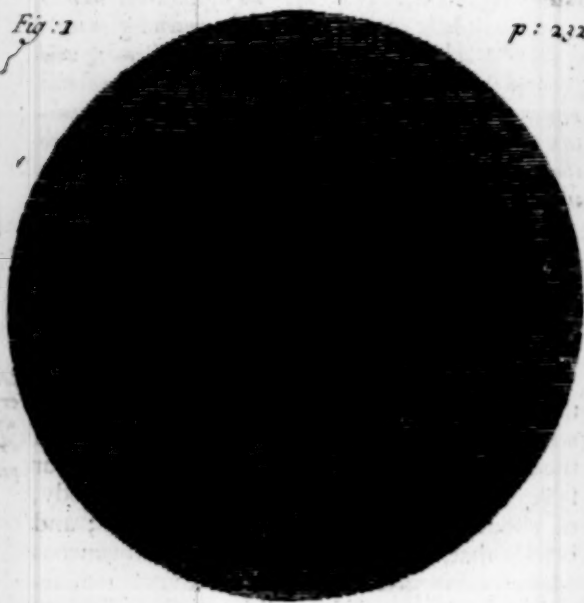
IV. If we consider what has been already said of the Nature of a Comet, or peculiarly of that *Atmosphere* which has been before shewn to have been the ancient *Chaos*, we ought to represent it to our selves as containing a Central, Solid, Hot Body, of about 7000 or 8000 Miles in Diameter; and besides that, a vastly large, fluid, heterogeneous Mass, or congeries of Bodies, in a very rare, separate, and expanded condition, whose Diameter were twelve, or perhaps fifteen times as long as that of the central Solid, or about 100000 Miles; which is the *Atmosphere* or *Chaos* now to be consider'd: In which we must remember was contain'd both a smaller quantity of dry, solid, or earthy Parts, (with a still much smaller of Aery and Watery) and a much larger quantity of dense and heavy Fluids, of which the main bulk of the *Atmosphere* was compos'd, all confusedly mix'd, blended, and jumbled together. In which state the *Theorist's* First Figure, excepting the omission of the Central Solid, will well enough represent it; and in which state we accordingly delineate it in the following Figure:

LEM. 42.
Etc. and
37, &c.
& Hypoth.
prior.

Theor. 2.35.

Fig: 1

p: 232



But upon the change of the Comet's Orbit from *Elliptical* to Circular, the Commencing of the *Mosaic* Creation, and the Influence of the Divine Spirit, all things would begin to take their own places, and each species of Bodies rank themselves into that order, which, according to the law of specifick gravity, were due to them. By which method the Mass of dense Fluids, which compos'd the main bulk of the intire *Chaos*, being heavier than the Masses of Earth, Water, and Air, would sink downwards with the greatest force and velocity, and elevate those
 Masse

Masses inclosed among them upwards. Which procedure must therefore distinguish the *Chaos* or *Atmosphere* into two very different and distinct Regions: The lower and larger whereof would be a collection or system of dense and heavy Fluids, or a vast *Abyss* immediately encompassing the central solid Body: The higher and lesser would be a collection, or system of earthy, watery, and aery Parts, confusedly mix'd together, and encompassing the said *Abyss*, in the same manner as that did the central Solid. And this I take to be the state of Darkeness, which the Proposition we are upon mentions: And that the *Chaos*, particularly, the Face or upper Regions of it, were at this time in such a dark and caliginous Condition, will easily appear. For all those Opaque or Earthy Corpuscles which before ro'ed about the immense Regions of the *Atmosphere*, and frequently even then obscur'd the Central Solid to any external Spectator, were now crouded nearer together; and instead of flying up and down in, or possessing an Orb of 40000 or 50000 Miles in thickness, were reduced to a narrower Sphere, and confin'd within a space not perhaps in Diameter above the thousandth part of the former; and must by consequence exclude the Rays of the Sun in another guess manner than before. We cannot but observe in our present Air, That the very same Vapours which, when dissipated and scatter'd through the *Atmosphere*, (whose extent yet is not great) freely admit the Rays of the Sun, and afford us clear and light-some days; when they are collected into Clouds, become opaque Masses, and are capable of obscuring the Sky, and rendring it considerably dark to us. In the same manner 'tis easy to suppose; that those Opaque and Earthy Masses, which in
the

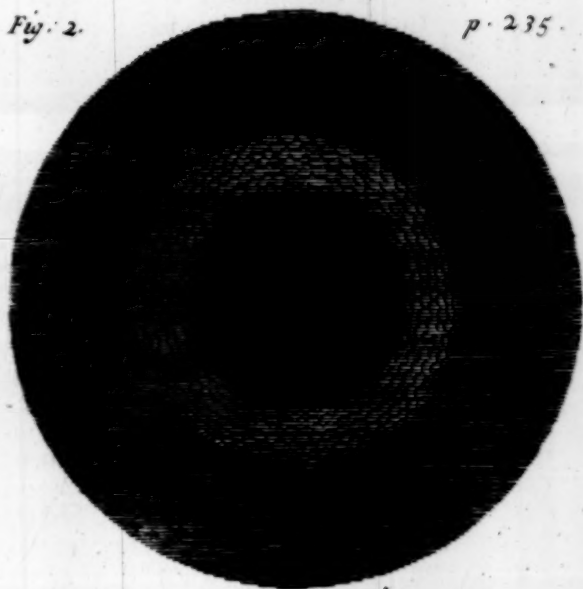
those vaster Regions would but in a less degree, and in some places, exclude the Beams of the Sun, must, when collected and crowded closer together on the surface of the *Abyss*, exclude them in a degree vastly surpassing the former; must occasion an entire darkness in all its Regions, and particularly in those upper ones, over which they were immediately collected. And if from the former comparison we estimate how few Vapours collected into a Cloud with us will cause no inconsiderable degree of darkness; and allow, as is but reasonable, a proportionably greater degree of darkness to a proportionably greater number of Earthy and Opaque Corpuscles crowded together; we shall not doubt but all manner of communication with the Heavenly Bodies, and the External World, must be intirely interrupted; and the least imaginable Ray or Beam of Light from the Sun excluded, not only from the lowest, but even all, excepting the very highest Regions of this superior *Chaos*. Which state of Nature, belonging to this time, immediately preceding the *Hexameron*, is not amiss represented by the *Theorist's* Second Figure, which is accordingly here delineated.

Theor. p.
36.

V. The

Fig. 2.

p. 235.



V. The Visible part of the First Day's Work was the Production of Light, or its successive Appearance to all the parts of the Earth; with the consequent distinction of Darkness and Light, Night and Day upon the face of it.

V. If we remember in what state we left the *Chaos* in the last Proposition, and suffer our thoughts to run naturally along with its succeeding mutations, we shall find that the next thing to be here consider'd, (for the Subterraneous System of dense Fluids, or the great *Abyss*, not coming directly within the Design of *Moses*, is
not

not here to be particularly prosecuted any farther) is the Separation of this Upper and *Elementary Chaos*, or Congeries of Earthy, Watery and Aery Corpuscles, into two somewhat different Regions; the one a Solid Orb of Earth, with great quantities of Water in its Pores; the other an *Atmosphere* in a peculiar sense, or Mass of the lightest Earthy, with the rest of the Watery and the Aery Particles, still somewhat confusedly mixt together. For since this Upper *Chaos*, (tho' in general much lighter than the *Abyss* beneath) consisted of parts very Heterogeneous, and of different specifick gravities (the Earthy being heavier than the Watery, and those yet heavier than the Aery Particles;) 'tis evident, that in the same manner as this whole mixed Mass was separated from the heavier *Abyss* beneath, must it again separate and divide it self into two such general Orbs as were just now mention'd. The former consisting of the denser and solidier parts, such as the Earthy, Clay, Sandy, Gravelly, Stony *Strata* of the present Earth, with so many of the Watery Particles as either being already in those Regions must be inclosed therein, or could descend from above, and have admittance into the Pores thereof: The latter of the less Solid, Lighter, and Earthy, with the rest of the Watery, and the Aery Particles, not yet sufficiently distinguish'd from each other. This process will I suppose easily be allow'd, excepting what relates to the enclosing of the Watery parts within the Earth; with relation to which, 'tis commonly suppos'd that because Water is specifically lighter than Earth, it must in the regular digestions of a *Chaos*, take the Upper situation, and cover that highest Orb, as that would others of greater gravity than it self. 'Tis also

also commonly imagin'd that the *Mosaick Cosmogony* favours such an *Hypothesis*, and supposes the Waters to have encompass'd the Globe, and cover'd its surface, till on the third day they were deriv'd into the Seas. Now, as I by no means apprehend any necessity of understanding the *Mosaick Creation* in this sense; so I am very sure 'tis contrary to a Philosophick account of the Formation of the *Chaos*; unless one of these two things were certain, Either that the quantity of Water were so much greater than that of Earth, that all the Pores and Interstices of the latter could not contain it; or else that it was generally elevated into the Air in the form of Vapour, and sustained there while the Earth settled and consolidated together, and did not till then descend and take its own proper place. The *former* of which is neither reconcilable to the *Mosaick Creation*, nor will be asserted by any who knows, even since the Deluge, how small the quantity of Fluids in comparison to that of the Solids is in the Earth on which we live. And the *latter* is too much to be granted in the present case by any considering person, who knows that a Comet's Vapours constitute the main part of that Tail or Mist, which is sometimes equal to a Cylinder, whose Basis is 1000000 Miles in Diameter, and its Altitude as far as from the Sun to the Earth, or 54000000 Miles; (as it was in the last famous Comet in 1681. represented in Mr. Newton's own Scheme) Let the rarity of the same be suppos'd as great as any *Phænomena* shall require. For to clear this matter by a familiar Instance or Experiment; Take Sand or Dust, and let them fall gently into a Vessel, till it be near full: Take afterwards some Water, and pour it alike gently into the same Vessel:
And

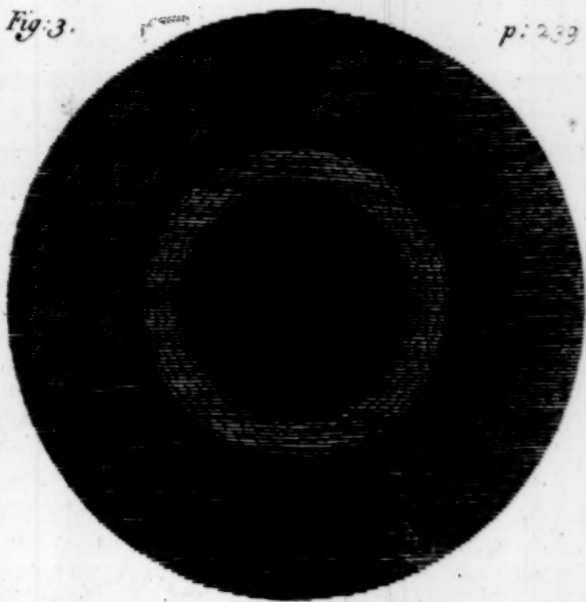
And it will soon appear, that, notwithstanding the greater specifick gravity of the Dry and Earthy, than of the Moist and Watery parts, (whence one might imagine that the Sand or Dust would be the lowest, and the Water swim uppermost on the surface of the other, without mingling therewith) yet will the latter immediately sink downwards, and so thoroughly drench and satiate the said Mass before any will remain on the top, that its proportion to that of the Solid parts will be very considerable. Which being apply'd to the point before us, will take away all imaginable difficulty in the case: It being evident, without this comparison, that such Watery Particles as were already intermix'd with the others would remain where they were; and with this, equally so, that the rest, which were above the same, upon the first subsidence of the Earthy *Strata* would penetrate, pervade and saturate the same. So that on this first *Day* or *Year* of the Creation, the Earthy and Denfer parts would take their places lowest, on the surface of the great Abyss; would settle in part into the same, and compose an Orb of Earth; and in its Interstices and little Cavities all such Watery Particles as were already in this Region, or descended upon it before its consolidation, would be enclos'd; and that as far above the surface of the *Abyss*, to which they would be contiguous, as their quantiry could enable them to reach. On this first *Day* or *Year* also the upper Regions of the *Chaos*, being now in some measure freed from those Earthy and Opaque Masses which before excluded the same, and caused the before-mention'd thick Darknes; would in some degree admit the Rays of the Sun. Now therefore that glorious Emanation, *Ligh**, the visible part
of

of this days Work, would begin to appear on the face of the Earth: Now would It, by the Annual Motion, successively illuminate the several parts of it: And now would it consequently cause that natural Distinction between Darkness and Light, Night and Day round the whole Globe, which was to be accounted for in this Proposition. Which progress of the *Chaos*, and state of Nature is well enough exhibited by the *Theorist's* third Figure; which therefore is here delineated.

Theor. p.
38.

Fig. 3.

p. 239



Corollary.

Corollary, Hence we may observe the *Justness* of the *Mosaick Creation*, and how fitly it begins at the *Production of Light*; without taking notice of such prior conditions, and such preparations of the *Chaos* which have been before explain'd, and were in order of Nature previous to this days *Work*. For this account reaching only to the *Visible World*, and the *Visible Effects* in it; and keeping still within the bounds of sense, and of common observation, could not better be accommodated to the truth of things, and the capacities of all, than by such a Procedure. The *Ancient condition* of the *Chaos* in former Ages was no way here concern'd, and so was intirely to be omitted. The *State of Darkness* which immediately preceded the *Six Days Work*, and which, with relation thereto, was necessary to be mention'd, made a very proper introduction, and so very fitly was to be hinted at by way of *Preface* thereto. Both which cases are accordingly by *Moses* taken care of. And so the first *Period* was the *Production of Light*, the *Admission of the Rays of the Sun*, and the *Origin of Day and Night* depending thereon; as the *Method and Decorum* of things, with the apprehensions of the People, did both very naturally require. For since in this *Sacred History of the Origin of things*, not only the *Visible World*, and the *Visible parts* of it were singly concern'd; But principally the *Effects* to be enumerated were such as requir'd the *Light and Heat of the Sun*, the one to be View'd, the other to be Produced by; and without the latter could no more have Been at all, than been *Conspicuous* without the former; 'Twas very suitable, and very natural in the first place to introduce the *Cause or Instrument*, and afterwards in the succeeding Periods, to recount the *Effects* thereof in the *World*: First to acquaint us that the *Light and Heat of the Sun* were in some measure admitted into the upper Regions of the *Chaos*,
and

and then to relate those remarkable consequences thereof which the succeeding Periods of the Creation exhibited on the face of the Earth. Which Order of Nature, and Succession of Things, is accordingly very prudently and fitly observ'd, and kept pace with, in this Sacred History.

VI. The visible part of the Second Day's Work was the Elevation of the *Air*, with all its contained Vapours; the Spreading it for an *Expansum* above the Earth, and the distinction thence arising of Superior and Inferior Waters: The former consisting of those Vapours, rais'd and sustain'd by the Air; The latter of such as either were inclos'd in the Pores, Interstices and Bowels of the Earth, or lay upon the Surface thereof.

VI. When at the Conclusion of the former Day the Heat of the Sun began considerably to penetrate the Superior Regions of the *Chaos*, and the two different Orbs, the Solider Earthy, and the Fluidier Aery Masses, began to be pretty well distinguished, the same things would proceed still on this succeeding Day. The Lower Earthy *Strata* would be settling somewhat closer together; the Watery parts would subside, and saturate their inward Pores and Vacuities, and the *Atmosphere* would free itself more and more from the heaviest and most Opake Corpuscles, and thereby become in a greater degree tenuous, pure, and clear than before. Whereupon by that time the Night or first half of this Second Day or Year was over, and the Sun arose, The Light and Heat of that Luminary, would more freely and deeply penetrate the Atmosphere, and become very sensible in these Upper or Aery Regions. Which being suppos'd, the proper Effect which were to be next expected must be, that vast quantities of Vapours would be elevated into, and there sustained by the now better

Z. purified

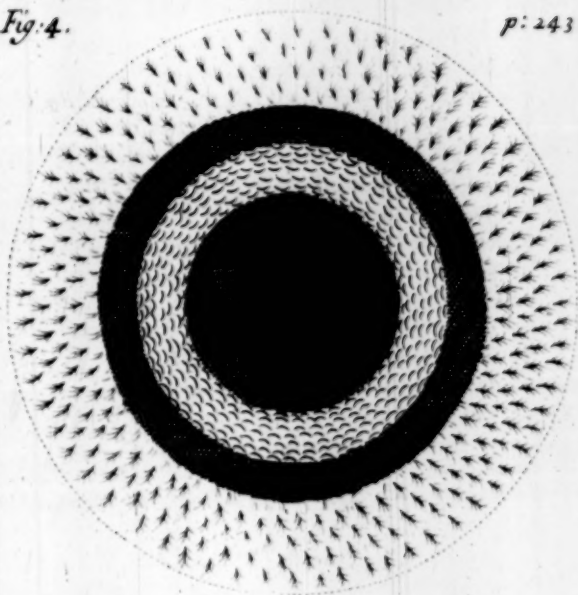
purified Air; while in the mean time all the Earthy Corpuscles which were incapable of rarefaction, and with them all such Watery Particles as were so near the Earth that the Sun's Power could not sufficiently reach them, were still sinking downwards and increasing the crassitude and bulk of the Solid Earth, and of its included Waters. From all which 'tis easie to account for the Particulars of this Day's Work. The *Expansum* or Firmament which was this day spread out above the Earth was plainly the *Air*, now truly so called, as being freed from most of its Earthy mixtures. The *Superior Waters*, All those which in the form of Vapour a half years heat of the Sun, with the continual assistance of the Central Heat, could elevate, and the Air sustain. The *Inferior Waters*, those which were not elevated, but remain'd below, all that fell down with, were enclosed in, sunk into, and, if you will, lay upon the Orb of Earth beneath. And when it is particularly said by *Moses* that 'twas this *Expansum* or Firmament which was to divide the Superior from the Inferior Waters, that is exactly agreeable to the nature of things, and suitable to this account: It being the *Air* which truly and properly sustain'd all those Vapours, as now it does the Clouds, above the Earth; and was thereby the means of separating them from their Fellows in the Bowels, or on the surface thereof. Which state of the *Chaos*, or Progress of the Creation, is well represented in the *Theorist's* fourth Figure; which here follows.

Theor. p.
39.

Corollary

Fig. 4.

p: 243



Corollary i. Hence appears a sufficient Reason why in this Six Days Creation one intire Day is allow'd to the Formation of the Air, and the distinguishing the Vapours in the same, from those beneath; which has hitherto seem'd somewhat strange and disproportionate. 'Tis certain this Work requir'd as long a time, and was of as great importance as any other whatsoever: All that Water which the Earth was to have in its Air, or upon its Surface, till the Deluge, being, 'tis probable, intirely owing to this day's elevation of them. For had they not been thus buoy'd up and sustain'd on high, they must have sunk down-

ward, and so been inclosed in the Bowels of the Earth, without possibility of redemption; and have rendred the Antediluvian World more like to a dry and barren Wilderness, than, what it was to exceed, a juicy fruitful and habitable Canaan.

Coroll. 2. Hence arises a new confirmation that the Days of the Creation were Years also. For seeing the quantity of Water which was preserv'd above-ground, and fill'd all the Seas before the Déluge, was no greater than was this Second Day elevated into Vapour; had this Day been no longer than one of ours at present, the foremention'd quantity would have been so far from saturating the Earth, supplying the Rivers, and filling all the Seas, that every day it would be wholly exhal'd afterwards, and suffer the intire Vegetable and Animal Kingdoms to perish for want of moisture. All which, in the Hypothesis we here take, is wholly avoided, and a very fit and suitable proportion of Waters preserv'd above for all the necessities of the Earth, with its Productions and Inhabitants. And this consideration affords one very good reason why the commencing of the Diurnal Rotation was defer'd till after the Formation of the Earth was over; there being an evident necessity thereof in order to the providing Water sufficient for the needs of those Creatures for whose sake the whole Creation was ordain'd and perform'd. In which procedure plain tokens of the Divine Wisdom cannot but be very conspicuous and observable to us.

VII. The visible parts of the Third Day's Works were two; the former, the Collection of the inferior Waters, or such as were now under the Heaven, into the Seas, with the consequent appearance of the dry Land; the latter, the production of Vegetables out of that Ground so lately become dry.

VII. In

VII. In order to the Apprehending of the *double* operation of this Day, we must call to mind what state the Orb of Earth was in by this time. We have seen already that it had been settling together, and fixing it self on the surface of the *Abyss* from the very beginning of the Creation; and we ought to suppose that in the space of two years it was not only become wholly distinct from the *Abyss* below, and the *Atmosphere* above it, but that it was settled and consolidated together, and its *Strata* grown firm and compacted. We must farther observe, that by reason of its Columns, different Density, and Specifick Gravity, (attested to, *à priori* from the *Chaos's*, and *à posteriori* from the internal Earth's *Phænomena*,) it was settled into the *Abyss* in different degrees, and thereby became of an unequal surface distinguish'd into Mountains, Plains and Valleys. Which things being suppos'd and consider'd, the two Works of this *Day* or *Year* of the Creation, which are of themselves very different, will be easily understood and reconcil'd. For when at Sun-set, or the conclusion of the last Day, we left the Air by half a Years Power of the Sun crowded with Vapours to a prodigious degree; upon the coming on of this Third Day, and in its Night or former half, the said vast quantities of Vapours must needs descend, and so by degrees must leave the Air pretty free, and take their places on the Surface of the Earth; altering thereby their own denomination, and becoming of *Upper* or *Cælestial*, *Lower* or *Terrèstrial* Waters. Indeed if we do but allow the effect to be in any measure answerable to the time, we shall grant that in the half year of Night, which is the former part of this Third Period of the Creation, the main Body of the

*Vid. Lem.
78. cum
Coroll. &
Hypoth. 2.
prior.*

Vapours must have not only descended down upon the Earth, but, by reason of the inequality of its Surface, and the Solidity withal, have run down from the higher and more extant parts, by the Declivities and Hollows, into the lowest Valleys, and most depressed Regions of all; must in these places have compos'd Seas and Lakes every where throughout the Surface of the Earth; and so by that time the light appear'd and the Sun's rising began the latter part of this Day, the intire face of the Globe, which was just before cover'd as it were with the descending Waters, must be distinguish'd into overflow'd Valleys, and extant Continents, into *Seas* and *Dry-land*, that very Work of this Day we were in the first place to enquire about. *The waters under the heavens were now gathered together into their respective and distinct places, and the dry land appear'd* and became fit for the Production of the Vegetable Kingdom. Which therefore most naturally leads us to the second branch of this Day's Work. For when this part hitherto was compleated on the Night or former half of this Day (which the Absence of the Sun so long together rendred peculiarly and solely fit to permit and procure the descent of the Vapours); and when at the same time the Dry Land was now distinguish'd from the Seas, and just become (in the utmost degree) moist and juicy; upon the Sun Rising, or coming on of the Day-time, 'twas of all other the most fit and convenient Season for the Germination of the Seeds of Vegetables, and the growth of Trees, Shrubs, Plants and Herbs out of the Earth. The Soil, Satur'd and Fatned by the foregoing half Year's descent of Vapours, was now like the *Ἰαυὶς* that fruitful Seminary of the Vegetable and Animal productions

productions of Primitive Nature, so much celebrated by all Antiquity. An intire half year of the Sun's presence together, was a time as proper and as natural for such a purpose as could possibly be desir'd. And when there was this half Year of Day to spare in this Period of the Creation, after one Work was compleated; and the same was so very fitly prepar'd and dispos'd for the production of Vegetables; 'tis no wonder that this above all the other Divisions has a double Task, and that the Seas and Dry Land were distinguish'd, and the Vegetables produc'd on the same Day or Year of the Creation; according as from the *Mosaick* History the present Proposition asserts. And if we allow for the defect of the inequalities of the outward Surface, too small to be therein consider'd; and suppose the *Atmosphere* somewhat clearer than before; the former figure will still serve well enough, and represent the progress and state of the Earth at the conclusion of this *Third Day*.

Theor. I.
1. p. 42.
& l. 2. c. 7.

Theor. p.
39. & su-
pra.

Corollary 1. *When according to our present accounts of these matters, this is the only day of the Creation to which a double work, and that the one quite different from the other, ought to be ascrib'd, and is ascrib'd by Moses; The Night being peculiarly fit for the former, and the Day for the latter operation; which could happen on none of the other Periods; This exactness of correspondence ought to be esteem'd an Evidence of the literal sense of the Writer, and of his accommodation to the nature of things; and a very considerable confirmation of those Hypotheses on which it so naturally depends.*

Coroll. 2. *Hence arises a Confirmation of what was before asserted that the Antediluvian Earth had only lesser Lakes and Seas, not a vast Ocean. For when the quantity of Waters belonging to the Earth*

Phenom.
43. p. 101.

and Air at first, was no more than was elevated in one half year, and at once sustain'd by the Air; no one will imagine it sufficient to fill the intire Ocean alone, if there had been neither lesser Seas, nor Rivers to be supply'd therewith. And so, vice versa, It having been prov'd by other Arguments, that there was no Ocean, but only lesser Seas, before the Flood, This Account which affords sufficient quantity of Water for the latter, but not for the former, is thereby not a little confirm'd.

Coroll. 3. Tho' the Heat and Influence of the Sun was on this Third Day very great, yet was his Body not yet Visible. For since at his Rising the Earth and lowest Regions of the Air were very full of moisture, while the higher Regions were very clear and bright; the force of his heat would be so great as to elevate considerable quantities of Vapours on a sudden, and thereby (e're the lowest Air had deposited its Vapours, and rendred it self transparent) the Sun would anew hide himself in a thick Mist, and so prevent his own becoming conspicuous, which otherwise 'tis not improbable he might this Day have been.

VIII. The Fourth Day's Work was the Placing the Heavenly Bodies, Sun, Moon, and Stars, in the *Expansion* or Firmament, i. e. The rendring them Visible and Conspicuous on the Face of the Earth: Together with their several Assignations to their respective Offices there.

VIII. Altho' the Light of the Sun penetrated the *Atmosphere* in some sort the first Day, and in the succeeding ones had very considerable influence upon it; yet is it by no means to be suppos'd that his Body was Visible all that while. Tho' we every day enjoy much more Light and Heat from the Sun than the Primitive Earth could, for a considerable space, be suppos'd to have done, yet 'tis but sometimes that the Air

is so clear as to render his Body discernible by us. A very few Clouds or Vapours gather'd together in our Air are able, we see, to hinder such a prospect for Weeks, if not Months together; while yet at the same time we are sufficiently sensible of his Force and Influence in the constant productions of Nature. Which things being duly consider'd, and the vastness and density of the *Upper Chaos* allow'd for, 'twill be but reasonable to afford a great space, even after the first penetration of Light, for the intire clearing of the *Atmosphere*, and the distinct view of the Sun's Body by a Spectator on the Surface of the Earth. I suppose no one will think the two first *Days* or *Years* of the 'Creation too long for such a work; or if any one does, the particular work and state of the *Atmosphere* on the second Day will prevent the most probable part of such a surmise, and shew the impossibility of the Sun's Appearance at that time. And the same reason will in a sufficient, tho a less degree, prevent any just Expectations on the *third Day*, as was observ'd in the last *Corollary*. But now upon the coming on of this *fourth Day*, and the *Sun's* descent and abode below the Horizon for an intire half year, those Vapours which were rais'd the day before must fall downwards, and so before the approach of the Morning leave the Air in the greatest clearness and purity imaginable, and permit the *Moon* first, then the *Stars*, and afterward, upon the coming on of the Day, the *Sun* himself most plainly to appear and be conspicuous on the Face of the Earth. This *fourth Day* is therefore the very time when, according to this Account, and the Sacred History both, these Heavenly Bodies, which were in being before, but so as to be wholly Strangers to a Spectator on Earth,

Atlas
Chin. Part
2. p. 46.
Apud
War. Geo-
log. p. 58.

Theor. p.
61.

Earth, were rendred visible, and expos'd to the view of all who should be suppos'd to be there at the same time. They now were in the Sacred Stile, *placed in the Firmament of Heaven, gave Light upon the Earth; began to rule plainly and visibly over the Day, and over the Night, and to divide the Light from the Darknes;* as ever since they have continued to do. And now the inanimate World, or the Earth, Air, Seas, and all their Vegetable Productions are compleat; and the Tradition of those *Chineses* who inhabit *Formosa*, and other Islands, appears well-grounded, and exactly true, who hold, That the World, when first created, was without Form or Shape; but by one of their Deities was brought to its full Perfection in four Years. Which Progress of the Creation, and State of Nature is exactly represented by the *Theorist's* fifth and last Figure; which therefore here follows,

IX. The

Fig: 5.

p: 251



IX. The fifth Day's Work was the Production of the Fish and Fowl out of the Waters; with the Benediction bestow'd on them in order to their Propagation.

IX. The Terraqueous Globe being now become habitable both to the swimming and volatil Animals; and the Air clear, and so penetrable by that compleat Heat of the *Sun*, which was requisite to the Generation of such Creatures; 'tis a very proper time for their Introduction. Which was accordingly done upon this fifth *Day* or *Year* of the Creation. Those Seeds, or little Bodies of Fish and Fowl which were contain'd in the Water,
(or

(or moist fruitful *Ἰαυὲς* of kin to it) were now expos'd to the kindly warmth of the *Sun*, and the constant supply of a most gentle and equal Heat from beneath; they were neither disturbed by the sudden alteration of the Temperature of the Air from the violence of Winds, or by the Agitations of the Tide (which was both very small, in these small Seas; and by reason of the absence of the *Diurnal Rotation*, imperceptibly easy, gentle, and gradual;) these Seeds, I say, when invigorated with the Divine Benediction, became now prolifick; and in this fifth Day's time a numerous Off-spring of the swimming and volatil Kinds arose, whereby the two fluid Elements, Water and Air became replenish'd with those first Pairs, which by the Benediction they straightway receiv'd, were enabled to become the original of all of the same Kinds, which ever were to be the Inhabitants of those Regions afterwards. Which time and procedure is no less agreeable to the State of the World in our *Hypothesis*, than 'tis to the express Affirmations of *Moses*, who makes Fish and Fowl the sole Product of the fifth Day or Year of the Creation.

X. The Sixth Day's Work was the Production of all the Terrestrial or Dry-land Animals; and that in a different manner. For the Brute Beasts were produc'd out of the Earth, as the Fish and Fowl had been before out of the Waters; but after that the Body of *Adam* was form'd of the Dust of the Ground; who by the Breath of Life breath'd into him in a peculiar manner, became a Living Soul. Some time after which, on the same day, he was cast into a deep Sleep, and *Eve* was form'd out of a Rib taken from his side. Together with several other things, of which a more particular account has been already given on another occasion.

X. The

X. The Earth being now grown more Solid, Compact, and Dry, its Surface distinguish'd into Sea and Dry-land, each of which were stor'd in some sort with Inhabitants and Vegetables, the Air being fully clear, and fit for Respiration, and the other Dispositions of External Nature being equally subservient to this, as well as it had been before to the last day's Productions; 'twas a proper Season for the Generation of the *Dry-land Animals*, and the Introduction of the noblest of them, *Man*; which accordingly were the first Works, on this sixth *Day* or *Year* of the Creation. Any more particular account of which, or of the following Works is not so directly the design of this *Theory*, and so shall not be here farther insisted on. We may only take notice of two things; the one is the peculiar *Manner*; the other the peculiar *Time* for the Creation of Man. As to the former, Tho' 'tis granted that all the other Day's Works mention'd by *Moses* were brought to pass in a natural way by proper and suitable Instruments, and a mechanical Process, as we have seen through the whole Series of the foregoing Creation; yet 'tis evident, as has been already observ'd, That an immediate and miraculous Power was exercis'd in the formation of the Body, and Infusion of the Soul of Man, as well as in some other particular Cases belonging to this Origin of Things. In plain terms, I take it to be evident, That that same *Jesus Christ*, our Blessed Mediator, who was afterward very frequently conversant on Earth, appear'd in a humane Form to the Patriarchs, gave the Law in a visible Glory, and with an audible Voice on Mount *Sinai*, guided the *Israelites* personally in a Pillar of Fire, and of a Cloud through the Wilderness, inhabited

Solut. 2.
prius.
Vid. John
i 18. and
v 37 and
vi 45, 46.
Math xi.
27. & John
iv. 12.
Rom i. 20.
Col. i 15.
1 Tim. i.
17. and 6.
15, 16.
with Exod
3. and 19.

and 20.
and 24. 10.
11. and 33.
9, 10, 11,
12, 13.
Numb. xii.
5, &c. and
14. 14.
Gen. 2.
and 3.
and 18.
and 19.
and 32.
24, &c.
Deut. 4.
and 5.
Vid. Prov.
viii. 22.—
32. Heb. i.
1, 2. with
11. 3. Col.
1. 14, 15,
16, 17.
John i. 1,
2, 3. Heb.
1. 10, 11,
12.

ted between the *Cberubims* in the Holy of Holies, and took the peculiar Stile, Titles, Attributes, Adoration, and incommunicable Name of the God of *Israel*, and at last was Incarnate, liv'd a true Man amongst us, died for us, and ascended into Heaven, makes still Intercession for us with the Father, and will come to Judge the World in Righteousness at the last Day: That this very same Divine Person was actually and visibly, in a humane Shape, conversant on Earth, and was truly and really employ'd in this Creation of the World (and particularly in this peculiar Formation of Man) so frequently ascribed to him in the Holy Scriptures. It being both unfit and impossible for the Divine Nature it self, or at least that of the Father, to be so much, and in such a manner concern'd with the Corporeal World, and the sinful Race of Mankind, as we find here and every where this *Divine Person*, our Blessed Mediator, to have been; as the Texts quoted a little above compar'd together do I think fully prove. Seeing therefore our Saviour Christ, God-man, was personally present, and actually employ'd in this Primitive Creation of the World: Seeing Man was to be a Creature intirely different from all the rest, a Being compounded of a Spiritual and Immortal Soul, and of a Material and Corruptible Body: Seeing in both these he was to be made in the likeness of that Divine Person, who created him, and be constituted his Deputy and Vicegerent among the Creatures here below; 'twas but reasonable there should be as great a distinction in his Original, as was to be in his Nature and Faculties, his Office and Dignity, his Capacities and Happiness from the other parts of the visible Creation; and by consequence,
that

that peculiar Interposition of God himself in the Formation of the Body, and Infusion of the Soul of our first Parents, so particularly observable in the *Mosaick* History, is both very agreeable to the Nature of things, very suitable to the Wisdom of God, and very reconcilable to the most Philosophick Accounts of this Origin of the World; and withal a remarkable token of the Dignity of Human Nature, of the distinction between his Soul and Body, and of the great Condescension and Love of God towards us, and so the most highly worthy of our consideration. Neither is the other circumstance the peculiar *Time* of the Creation of Man to be pass'd over without a proper Reflection on it. Twere easy to shew, That none of the preceding Days were in any degree so fit for; nay, most of them not capable of this Creation and Introduction of Man. But upon this sixth Period, when every thing which could be subservient to him, and advance his felicity, was compleated; he who was to be the Lord of All, and for whose sake the whole was fram'd, was brought into the World. When the *Light* had been penetrating into, and clarifying this dark and thick *Atmosphere* for more than five compleat *Years* together; when the *Air* was freed from its numberless Vapours, and become pure, clear, and fit for his Respiration; when the *Waters*, as well superior as interior, were so dispos'd as to minister to his necessities by Mists and Dews from the Heavens, and by Springs and Rivers from the Earth; when the *Surface of the Earth* was become dry and solid for his support, and was cover'd over with Trees, Shrubs, Plants, Herbs, Grass, and Flowers for his Sustenance and Delight; when the glorious *Firmament of Heaven*, and the beautiful

Pſalm viii.
6.

beautiful System of the *Sun*, *Moon*, and *Stars* were visible and conspicuous to him, the Objects of his Contemplation, the Distinguishers of his Seasons; by whose powerful Influences the Earth was invigorated, and the World rendred a fruitful and useful, a lightfome and pleasant Habitation to him; when, lastly, *all sorts of Animals* in the *Seas*, in the *Air*, or on the *Earth*, were so dispos'd as to attend, benefit, and please him one way or other; when, I say, all these things were by the Care, Beneficence, and Providence of God prepar'd for the entertainment of this principal Guest, then, and not till then, was *Man* created and introduc'd into the World: Then, and not before was *He* constituted the Lord and Governor of the whole, and *all things put in Subjection under his feet*. In which intire procedure the Wisdom and Goodness of the Creator, and the Dignity and Honour of his principal Creature here below, are equally consulted; and the greatest occasion imaginable given to our first Parents, and all their Posterity of adoring and celebrating the Divine Bounty to them in the present and succeeding Ages. Which naturally leads us to the next Proposition.

XI. God having thus finish'd the Works of Creation, Rested on the Seventh day from the same; and Sanctified or set that Day apart for a Sabbath, or Day of Rest, to be then and afterward observ'd as a Memorial of his Creation of the World in the six foregoing, and his resting or keeping a Sabbath on this Seventh day. Which Sabbath was reviv'd, or at least its Observation anew enforc'd on the *Jews*, by the Fourth Commandment.

XI. Nothing sure could be more fit and proper at this time than the praising and worship-
ing

ping of that Powerful and Munificent Creator, who in the foregoing six Days Productions had so operously and so liberally provided for the well-being and happiness of Mankind. And seeing this intire Fabrick was design'd for the use and advantage of all succeeding Generations as well as the present, it could not but be reasonable to perpetuate the Memory of this Creation, and devote one Period in seven to the peculiar Worship and Service of that God who was both the Author of the Works themselves, and of this Institution of the Sabbath, to perpetuate the memory of such his six Days of Work, and of this seventh of Rest, to all future Generations. What relates to the Fall of *Adam*, and the intire Moral State of the World, comes not within the compass of this Physical *Theory*, and so (notwithstanding it naturally enough belongs to this Day, and night, I imagine, be shewn not to be so difficult, as for want of a right understanding thereof, 'tis usually imagin'd to be, and that without receding from the literal, obvious, and usual Sense of Scripture) must be wholly omitted in this place.

XII. There is a constant and vigorous Heat diffused from the Central towards the superficial Parts of our Earth.

XII. This has been already accounted for, and need not here be resum'd.

Corollary. *From the consideration of the very long time that the Heat of a Comet's central Solid may endure, 'tis easy to account for that otherwise strange Phenomenon of some of those Bodies, viz. That tho' the Tails of the Comets appear to be no other than Streams of Vapours rarified by the prodigious Heat acquir'd in their approaches to the Sun; yet some at*

A a

least

Vid. Lem.
65. & Hypoth. 1.
Arg. 7.
prius.
Vid. Fig. Comet. A.
D. 1680.
apud Newt. & nostram,
Fig. 1.

least of these Comets have no inconsiderable ones as they are descending towards the Sun, long before they approach near enough to acquire new ones by a fresh Rarefaction of their Vapours in his Vicinity. For since the prodigious Heat acquir'd at the last Perihelion must remain for so many thousands of Years, tho' the Tail which the Sun's own Heat rais'd at that time must have been either dispersed through the Ether, or by its Gravitation return'd to its old place in the Atmosphere; yet will there still remain a Tail, and its Position will be no other than if the Sun's own Heat had elevated the same. For by what Heat soever the Vapours in a Comet's Atmosphere become rarer than the Parts of the Solar Atmosphere in which they are, or subject to the Power and Velocity of the Sun's Rays elevating the same, a Tail must be as certainly produc'd as if the Sun's own Heat were the occasion of it. Which Observation rightly consider'd, will afford light to the foremention'd Phenomenon, and will deserve the consideration of Astronomers, to whom it is submitted.

XIII. The habitable Earth is founded or situate on the Surface of the Waters; or of a deep and vast Subterraneous Fluid.

Lem. 71,
&c And
Solut. 5, 6,
7. prius.

XIII. This has been sufficiently explain'd already, and is observable in the foregoing Figures of the four latter periods of the *Mosaic* Creation.

XIV. The interior or intire Constitution of the Earth is correspondent to that of an Egg.

XIV. This is also very easily observable in the same Figures: Where (1.) the *Central Solid* is answerable to the *Yolk*; which by its fiery Colour, great Quantity, and innermost Situation, exactly represents the same: Where (2.) the great

great *Abyss* is analogous to the *White*; whose Density, Viscosity, moderate Fluidity, and middle Position, excellently express the like Qualities of the other: Where (3.) the *upper Orb* or habitable Earth corresponds to the *Shell*, whose Lightness, Tenuity, Solidity, little inequalities of Surface, and uppermost Situation admirably agree to the same. 'Tis indeed possible to suppose that the Quantities, specifick Gravities, and Crassitudes of each Orb (to instance in nothing else here) may be in the Earth proportionable to their *Analogous* ones in an *Egg*; but because the Similitude is so very obvious and full in the foregoing more certain respects, and more than sufficient on those accounts to solve the present *Phænomenon*; and because a bare possibility, or fancied probability cannot deserve any more nice consideration; I forbear; and look upon the Coincidences already observ'd, not a little surprising and remarkable.

XV. The Primitive Earth had Seas and Dry land distinguish'd from each other in great measure as the present; and those situate in the same places generally as they still are.

XV. The former part of this has been already sufficiently explain'd; and of the latter part there can then be no reason to make any question; since the same Earth that was made at first, does still, as to its main parts, remain as it was to this Day. Solut. 7. prius.

XVI. The Primitive Earth had Springs, Fountains, Streams, and Rivers, in the same manner as the present, and usually in or near the same places also.

XVI. The Origin of Fountains and Rivers is undoubtedly either from Vapours descending
A a 2 from

from *without* the Surface of the Earth, or from Steams elevated by the heat *within*. And which way soever we chuse to solve the present, 'twill also serve to solve the Primitive *Phænomena* here mention'd. 'Tis only to be observ'd, That before the upper Earth was chap'd and broken at the commencing of the *Diurnal Rotation*; and indeed before the *Strata* became so firmly consolidated as they afterward were, the subterraneous Steams would arise, and pass through the same more uniformly, and more easily, and so more equally dispense their Waters over every Part and Region of the Earth, than afterward.

Essay, p.
121, &c.
and p. 152.

Corollary. *If therefore Dr. Woodward be right in asserting, That the Cracks and Fissures, which he calls perpendicular ones, since the intire Consolidation of the Strata of the Earth, are necessary to the Origin of Springs, (and I believe he may have good grounds for his Opinion) from the Being of such Springs and Fountains after the Consolidation of the Strata, and before the Flood, 'tis evident, that the Diurnal Motion did not commence till after the Annual; nay, till after the Formation and Consolidation of the Earth: And so what on other grounds was before rendred highly probable, will appear nearer to certainty on This: For 'tis plain, If the present Diurnal Motion commenc'd either with the Annual, or indeed any time before the Formation of the Earth, the Figure of the Chaos, and so of the Abyss and Upper Earth, would originally be that of an Oblate Sphæroid, as it is now; the Strata would be all coherent, united, and continued, without any Cracks or perpendicular Fissures at all; and the Origin of Springs, on the Doctor's Grounds, must in a natural way be plainly impossible. Since therefore the Diurnal Rotations commencing after the Consolidation*

Vid. Lem.
67, 68, 69.
prius.

tion

tion of the Strata gives a Mechanical and Natural Account of the Chaps and perpendicular Fissures; since without the same in the present Case no natural Cause of them is by any assigned; since withal 'tis unquestionable that there were Springs and Rivers before the Flood; and since, lastly, it appears that such Fissures were necessary to the being of those Springs and Rivers, 'tis very reasonable, nay, necessary to suppose, that the Diurnal Rotation did not commence till after the Formation and Consolidation of the Earth was over; or, which is almost all one, till the Fall of Man, as we formerly asserted.

Hypoth.
3. prius.

XVI. The Primitive Earth was distinguish'd into Mountains, Plains, and Vallies, in the same manner, generally speaking, and in the same places as the present.

XVII. This has been sufficiently explain'd already, and need not here be reassum'd. And that each of these Seas, Springs with their Rivers, and Mountains, were generally the same, and in the same places as the present, there is no reason to doubt; they being usually the very same individuals then and now, and so unquestionably cannot have chang'd their primary Situations.

Lem. 71.
Sec. and
Solut. 7.
prius.

XVIII. The Waters of the Seas in the Primitive Earth were *Salt*, and those of the Rivers *Fresh*, as they are at present, and each, as now, were then stor'd with great plenty of Filth.

XVIII. This has no difficulty in it, seeing our present Seas and Rivers are the very same, or of the same nature; and their several Inhabitants the Spawn or Off-spring of those primitive ones.

XIX. The Seas were agitated with a like *Tide*, or *Flux*, and *Reflex*, as they are at present.

A a 3

XIX. The

Lem. 79.
cum Co-
rol. prius.

XIX. The presence of the *Moon* and *Sun* being the cause of the Tides, and those Bodies by consequence being equally dispos'd before, as since the Deluge, to produce them; this Proposition can have no manner of difficulty. Only we may take notice of these two things, (1.) That in the State of Innocence, before the Diurnal Revolution began, the frequency of the Tide must depend on the *Lunar* Period, and happen but twice in each Month, as now it does in somewhat above a days time with us: On which account the increase and decrease of the Waters would be extremely gentle, leisurely, and gradual, without any imaginable Violence or Precipitation. (2.) That in the whole *Antediluvian* State the Tides were lesser than since, by reason of the smallness of the Seas *then* in comparison of the great Ocean, from whence *now* the most considerable ones are deriv'd. All which yet hinders not, but they might be sensible enough in some Creeks, Bays, and Mouths of Rivers: The peculiar circumstances of those places in *that* as well as in the *present* State, rending the Tides, the Elevations and Depressions of the Waters *there*, most considerable and violent of all others.

XX. The Productions of the Primitive Earth, as far as we can guess by the remainders of them at the Deluge, differ'd little or nothing from those of the present, either in Figure, Magnitude, Texture of Parts, or any other correspondent respect.

XX. These things seem to depend on two Particulars; *viz.* partly on the primary Bigness, Figure, and Constitution of the constituent, insensible Parts or Elements of Bodies; and partly on the quantity of Heat made use of in their Production

Production or Coalition. Which being suppos'd, the Proposition will easily be establish'd. For, as to the first, I suppose they remain invariably the same in all Ages, and are by any natural Power unalterable. And as to the last, whatever be to be said of the State of Innocence, or the first Ages succeeding, on some peculiar accounts, which I believe might be warmer than at present; yet as to the times here referr'd to, there is no need to suppose any great difference of Heat, either from the *Sun*, or the Central Body: And indeed, all the difference on any accounts to be suppos'd between the Heat before and since the Deluge, must be too inconsiderable to be taken notice of in any such sensible Effects as this Proposition does refer to. For the *Sun's* heat was not above a twenty fifth part greater than 'tis now, and the space of four or five thousand Years makes but a small difference in that of the Central Solid, if at first it were heated any whit near the degree mention'd in the Calculation referr'd to in the Margin. And tho' its real Heat were decreas'd, yet in case its facility of Penetration were increas'd in the same Proportion, the heat on the Face of the Earth would still be equal and invariable. And so by these accounts, the Productions of Nature in all Ages must be pretty equal and agreeable, as this Proposition requires.

Corollary. *Tho' the Lives of the Antediluvians were so much longer than ours at present, yet were they not generally of a more Gygantick Stature than the past or present Generations since have been. In all which Ages, notwithstanding, there have been some of an extraordinary Bigness and Stature, and will be still no doubt in the future Ages to the end of the World.*

Phænomen.
23. & 27.
prior.

Lem. 63.
prior.

XXI. The Primitive Earth had such *Metals* and *Minerals* in it, as the present has.

XXI. This is easily accounted for. For since the *Antidiluvian*, and the present Earth, are either the very same, as the lower Regions; or at least of the same nature, the Off-spring of a Comets *Atmosphere* (as even that acquir'd Crust at the Deluge was) 'tis no wonder if each of them contain the same *Species* of Bodies within it.

XXII. Arts and Sciences were invented and improved in the first Ages of the World, as well as they since have been.

XXII. There is little need of giving particular Reasons for this. All I shall observe, is, That seeing the Ignorance and Barbarity of the Ages after the Deluge, is the greatest Objection against this Proposition; 'tis avoided in our *Hypothesis*. The insensible, tho' prodigious Change of the State of Nature, and the perishing of all the Monuments of the old Learning or Arts at the Flood, with the want of correspondence in the latter Years to the former Tradition, reducing the few remainders of the former State wholly to seek for their Learning, notwithstanding it might have been cultivated and improv'd to great degree before the Deluge; as therefore in all probability it was.

CHAP. II.

A Solution of the Phænomena relating to the Primitive State of the Earth.

XXIII. The *Primitive* state of the Earth admitted of the primary production of Animals out of the Waters and Dry Ground, which the subsequent states, otherwise than in the ordinary method of Generation, have been incapable of.

XXIII. **T**IS not to be expected that I should here be able to give a full and methodical account of the growth of the *Primitive* Pairs of Animals, and of the several dispositions of the *Primigenial* state of Nature subservient or contributory thereto. The method of the Generation of Animals is it self in general so little known, and the History of this first stage of the World, as well so short in the Sacred Writings, as so difficult to be, in all its circumstances, now otherwise understood, that such an Attempt might justly be look'd upon as too rash a presumption. All that ought to be expected, and all that I shall endeavour is this; To shew, that as far as is known of that Original Earth, its properties were as peculiarly fit for, as those opposite ones of the succeeding are incapable of, such a production of Animals at first, as this Proposition takes notice of. Which the five following particulars shall include. (1.) The long and continued spaces of Day and Night in the *Primitive* state did capacitate it for such productions; which the quick returns of the same afterward prohibited.

Hypoth.
3. prius.

Solut. 7.
prius.

prohibited. 'Twill be easily granted, that in the Generation of Animals there must be a pretty constant and continual warmth, without the frequent interposition of Cold during the most part of the process. Now this the long days of half a year afforded these Primary *Embrios*; which the short ones of only twelve small hours, and the sudden and frequent returns of equal Nights, has utterly deni'd to any such ever since. (2.) The *Primitive* Earth was moist and juicy enough to supply nourishment all the time of the Generation of the *Fœtus*; which after it was once become perfectly Dry and Solid was not again to be expected. It was before observ'd, that upon the descent of the vast quantities of Vapours on the Third Day, the ground was so tender, soft, and full of juices, as very naturally answered to what all Antiquity made the fund and promptuary of the rising Plants and Animals, the famous *'Iau's*. And as that was but a necessary qualification of a Soil which was to produce Animals, so the want of it ever since takes away all hopes of a like Propagation. (3.) The *Primitive* state of the Earth and Air, where the Animals were produc'd, had heat sufficient for that purpose; which the subsequent has not. 'Tis evident that a greater heat than the present Earth or Ambient Air can afford, is requisite to, and made use of in the present Generation of Animals (which the Incubation in the Oviparous, and the still warmer Position of the *Fœtus* in the Viviparous Animals assure us of:) On which account the present Earth must needs be incapable of their production. But that the Heat in the *Primitive* Earth, and particularly where the Animals were produc'd, was much greater, will thus appear.

As

As to the Heat from the Central Body ; while the Earth was somewhat loose, and pretty freely admitted the ascending steams, that, would be considerably greater than after its more intire consolidation, when these steams were thereby so much confin'd within, or diverted to some particular conceptacles. Besides, The Production of Animals was near *Paradise*, and I suppose no where else. Now those middle Regions, (of which *Eden*, the Country of *Paradise*, was one) being situate under the ancient Ecliptick, and present Tropic, (of which before) enjoy'd also a greater Heat from the same Central Body by reason of their greater nearness thereto, than since they or the corresponding parts of the *Torrid Zone* do or can partake of. For when the Earth was then perfectly Spherical, the middle, and their neighbouring parts were about 10 miles nearer the Central Solid than the same Regions now are : (They being in that proportion Elevated, and the circumpolar depress'd at the commencing of the *Diurnal Rotation* :) Which greater Vicinity of the Central Heat must certainly have a suitable effect, and cause somewhat warmer Regions thereabouts than they have been ever since. Moreover, If the real proper heat of the Central Solid be in any considerable proportion diminish'd in near 6000 years time, (as in *some* proportion it must be) That degree of Heat which it had at first, was still the most powerful of all other ever since. But then as to the Solar Heat, (to take no notice of the greater nearness of the Sun's Body before the Deluge than since, as not directly reaching the present case :) 'Tis evident that *Paradise*, situate under or near the very Ecliptick it self, must receive the utmost power
of

Hypoth 4.
prius.

Lem. 67,
68. cum
coroll.
prius.

Phænomen.
39. prius.

Solut. 19.
prius.

Phænomen.
36. prius.

Solut. 2.
prius.

of the same heat which any part of the Globe were capable of, which by lying under the Tropick afterward it would not do. On all which accounts joyn'd together, 'tis evident that the heat in the *Primitive* State was much more considerable, and so much more adapted to the Generation of Animals than that in the subsequent ever was or can possibly be. (4.) The *Primitive* state was perfectly still and calm; free from all such winds, storms, violent tides, or any the like hurries and disorders as at present wholly render the production of Animals impossible: Which quiet condition, if in some respects it endur'd till the Deluge, yet, as even in those the Paradisiacal state might have the preheminance; so in others, particularly the gentleness of the Tides, it had still the most peculiar advantage; as was before observed. (5.) The Equability of Seasons, and the greater uniformity of the Air's temperature, which in part remain'd till the Deluge, but might be more signal in the *Paradisiacal* state, rendred that Earth as proper, as the contrary sudden, uncertain, and violent extreams of heat and cold, drought and moisture, sultry and frosty Weather now, wholly indispose it, for such a production of Animals. Which Prerogatives of the *Primitive* Earth and Air will certainly demonstrate, if not its intire fitness, yet sure its less unfitness for such an original Generation as was here to be accounted for, and is all, as was before observ'd, that can justly be requir'd and expected in the present case.

Corollary. *When it has been before allow'd, that all Generation is but Nutrition; and that all Seeds, as well of Animals, as of Plants, are the immediate workmanship of God; 'Tis evident that this Supposition*

sition of the Original Production of Animals out of the Waters and Earth; according to the plainest letter of the Mosaick History, does by no means derogate from the Divine Efficiency, and the wonderful Art and Skill in the Structure of their Bodies; nor in the least favour that ungrounded and pernicious opinion of the Equivocal or Spontaneous Generation of any of them.

Vid. Bentley, Serm. 4.

XXIV. The Constitution of Man in his *Primitive State* was very different from that ever since the Fall; not only as to the Temper and Perfections of his Soul, but as to the Nature and Disposition of his Body also.

XXIV. The Book of *Genesis* affords us so short a History of this *Primitive Stage* of the World, and of the Constitution of Man therein; and all other accounts are so inconsiderable in this respect, that a particular account of all things relating to this Proposition is by no means to be expected. 'Tis in general sufficient, that we have, from Sacred and Prophane Authority, evinc'd the state of External Nature to have been mighty different from the present; and that consequently the State of Man, even on Philosophical Considerations, ought to be suppos'd equally different from the present also. And 'tis so highly unreasonable from meer observations made now, to pass a Censure on what was done then; and from the Frail, Imperfect, Sinful, and Miserable Condition of Humane Nature in our Days, to judge of the same in its State of Innocence, Perfection and Felicity; or from the Circumstances it is in at present, to determine those it must at that time have been in; that nothing can be more so. We might almost as well Argue that *Angels* Eat and Drink,

Lem. 70. cum Co-roll. & Hypoth. 3. prius.

Drink, Sleep and Wake, Work and Rest, because *We* do so ; or that the *Infant* in the Womb Sees and Hears, Talks and Discourses, Reads and Writes, because afterward *He* commonly does the same things, as that because *We* have need of Cloathing to cover our Shame, and have Inflexible, Robust, and in a certain time Corruptible Temperaments of Body, therefore so had our *Primitive Parents* in the State of Innocency. But to speak somewhat more distinctly to those two particulars included under this Proposition, (1.) That in the actions relating to the propagation of the *Species*, there should be no sense of Shame, and consequently no occasion for covering such parts as were therein concern'd, is by no means strange, in a state of Innocence ; where there was no inclination to any sinful kind or degree of Application, and where all such inferior Appetites were in compleat subjection to the Superior, the Reason and Conscience of Man. 'Tis rather an evident Token of our Guilt, a demonstration of the disorder and pollution of our Nature and Faculties *now*, that what in permitted circumstances is innocent and natural in it self, nay necessary for the propagation of the *Species*, and the preservation of Mankind, should make us blush: 'Tis a plain note of the vileness of our *present* state, a mark of the baseness of our condition *now*, that what God and Nature have ordain'd for the continuation of the World, should yet inevitably seem to have something of Indecency and Turpitude adhering to it : So far, that meer bashfulness and modesty oblige us to conceal and pass over in silence all that belongs thereto. It indeed might more reasonably be made a query, why the Covering our Nakedness has been so general,

general, and is so necessary now, (as it has justly by all Ages and Nations been esteem'd) than why it was otherwise in this *Primitive* state of the World. (2.) That the use of one sort of Food (that of the *Tree of Life*) might be capable of fixing and settling the temper of a humane Body, of rendring it so lasting, that, while its Earthly condition was to continue, it might never be dissolv'd; and that the use of a contrary sort of Food, (That of the *Tree of Knowledge of Good and Evil*) might be capable of so far corrupting and disordering the same, that it would become subject to Sickness, Misery, and Dissolution in a shorter space, is, I think, even by what we at present see, by no means incredible. We cannot but observe how great a change a course of Diet, moderate, wholesome, and agreeable, will make in our present temperament for the better; and on the contrary, how far an intemperate, and immoderate indulgence of our Appetites, either as to the kinds or quantities of our Meats and Drinks, tho' but for a few Weeks or Months, will do the same for the worse; even to the spoiling and destroying of a very good habit of Body, to the depriving men of their healths; nay frequently of their Lives too by a violent Disease. If we therefore, to take the narrowest Supposition, imagine the eating of that pernicious and forbidden Fruit to have been confin'd to one Day or Year of this *Primitive* State (which yet there is no necessity of doing); 'twill be no harsh or incredible supposal; especially, if we consider what has been said of the present State of Things, and how much more the temper of our first Parents Bodies, and the particular Food on which they fed, might be peculiarly fitted for
the

the same purposes ; that the intemperate Indulgence of a very pestilent course of Diet for so many Months together might break and pervert the well temper'd Constitutions of our first Parents, might render their Bodies liable to such Distempers as in length of time would dissolve and entirely overthrow them ; or, in other words, would render *Mankind sickly, miserable, and mortal Creatures for ever after.* Which is, I think, enough to clear the Proposition before us, so far as a bare *Physical Theory* is concern'd therein.

XXV. The Female was then very different from what she is now ; particularly she was in a state of greater Equality with the Male, and little more subject to Sorrow in the Propagation of Posterity than he.

XXV. That the original State and Circumstances of the Female, should be as they are here represented, is so far from being strange, that the contrary ones of that Sex at present, were not the occasion thereof known, might much more justly appear so. For granting the Equality of Humane Souls in themselves, 'tis not very easy to give a good reason, why that part which one half of Mankind was to bear in the Propagation of it, should subject it to such a low Condition, great weakness of Nature, and those severe Pains and Agonies which did not at all affect the other ; as God and Nature have at present made unavoidable. And as to the change of her Name after the Fall, from *Adamah* and *Ishab* to *Eve* (which latter seems to denote her Capacity *then attain'd* of becoming the Mother of all those Generations of Mankind which were afterward to live on the Face of the Earth) it may probably intimate (to omit any other Observations that might be made on it) some change

Gen. v. 2.
& ii. 23.
24. with
iii. 20.

change in the Method or Circumstances concerning Humane Generation. And if we consider, that *Adam* and his *Wife* were no inconsiderable time in Paradise together, even after the Blessing of Increase and Multiply, before their Fall; and carefully consider the Texts quoted in the Margin, we shall perhaps believe 'tis no improbable conjecture.

Gen. ii. 25;
& iii. 7,
10, 11. &
iv. 1.

XXVI. The other Terrestrial Animals were in a state of greater Capacities and Operations; nearer approaching to reason and discourse; and partakers of higher degrees of Perfection and Happiness, than they have been ever since.

XXVI. Since the *Primitive* state of External Nature was so exceeding different from the present, as has been already prov'd; the other Terrestrial Animals, as well as Man, ought to be suppos'd of a somewhat proportionably different Temper, Abilities and Actions. Besides, The Divine Providence is concern'd to suit one Being to Another; and to accommodate still the subordinate, to the Superior rank of Creatures in the World: On which account 'tis not strange, that the Brute Animals were in their Primitive Constitution very much distinguish'd from, and advanc'd above such as are now upon the Earth; the Diversity with Relation to Mankind, to whom in each Period they were to be subservient, being so very remarkable. For since Mankind upon the Fall degenerated into a Sensual and Brutish way of Living, the Brute Creatures themselves would very unwillingly have paid their due homage and submission, had not they in some degree degenerated from their Primitive Dignity at the same time. Which degeneracy suppos'd, a former greater degree of

B b

Abilities,

Abilities, Operations, and Happiness is at the same time suppos'd also. And to strengthen this conjecture, I may venture to Appeal to *Anatomy*, whether the present Bodies of Bruits do not appear capable, as far as can be discover'd, of nobler operations than we ever now observe from them. The advantage of even *Mankind* in this respect seeming not very considerable over the *Bruits that perish*.

XXVII. The temper of the Air, where our first Parents liv'd, was warmer, and the Heat greater before the Fall than since.

XXVII. This has been already accounted for in the twenty third Proposition before.

XXVIII. Those Regions of the Earth where our first Parents were plac'd, were productive of better and more useful Vegetables with less Labour and Tillage than since they have been.

XXVIII. That we may account for this Proposition, and that Curse which was inflicted on the ground at the Fall; in good measure included therein; we must observe, that the growth of Plants and Vegetables depends on a degree of Heat proportionate to the peculiar temper and exigence of each Species; and by consequence that, let the number of Seeds in any Soil be never so many, or their kinds never so diverse, yet the Surface of the Earth must remain bare and barren, until the peculiar Heat of the Season and Climate be adapted to them: Now seeing different kinds of Seeds require different degrees of Heat, 'tis only such certain kinds of the same that will at once shew themselves, or spring out of the Earth; the rest, to which the Heat is not adjusted, lying all the while

while as Dormant and Dead as if they did not really Exist in Nature. Thus we have several distinct Crops of Vegetables in the several Seasons of the Year. Those Seeds which the small Heat of *February* and *March* is not able to raise, lye still in the Earth till the greater force of the Sun in *April* and *May* excite them. In like manner several others, which are too crass and unpliant for the moderate warmth of the Spring, are by the yet greater intenseness of the Heat in *June*, *July*, and *August*, rais'd from their Seats, and oblig'd to shoot forth and display themselves. Nay, when in the Months of *September* and *October* the Sun's Power is diminish'd, and its Heat but about equivalent to that of *March* and *April*, it again suits the Plants which were then in Season; so that they many of them spring up afresh in these Months, and flourish over anew, as before they did in those; as Dr. Woodward

very well discourses upon this occasion. In like manner we may also consider this matter with relation to the different Climates and Zones of the Earth, and their quite different Crops of Plants, according to those different degrees of Heat made use of in their Vegetation. When therefore we observe in the same Country a various Crop and Order of Vegetables every Year, according to the various Power of Heat in each Season; (a different Face of the Earth being gradually visible from *February* till *July*, in proportion to the gradual increase of Heat all that space;) we cannot tell, in case the Heat increas'd still to a greater intenseness afterward, but a new and unseen Face of things might appear; and many unheard-of kinds of Vegetables might put forth, and expose themselves to our Observation, even in the present State and Age of the World.

Essay, p.
157, &c.

But as to the *Primitive* World, wherein all the Seeds of those Vegetables which God Originally Created were fresh and vegetous, and wherein there was a much greater Heat than since has been to invigorate and produce them; 'tis very reasonable, and very agreeable to Nature to suppose, that many sorts of Trees, Plants, Herbs, and Flowers, which the colder temper of the subsequent Earth were unable to excite and produce, were then every Year rais'd, and became the principal Recreation and Sustainance of our first Parents in the state of Innocency. 'Tis very probable they might never see such a Poor, Jejune, and Degenerate State of the Vegetable Kingdom as we since have done, till their unhappy Fall occasion'd the Introduction of that miserable condition of all things which has ever since continued among us. Thus as one Country or Climate, because of its greater Coldness, is now the Seminary of several Vegetables which the warmer Regions are either perfect Strangers to, or advance to a greater degree of perfection; So upon the degeneracy of the *Primeval* State into the *present*, and the mighty Abatement of the Ancient Heat (taken together with the worse Juices and other effects of that Abatement contributory perhaps to the same thing) 'tis natural to allow that several such Vegetables (suppose *Thorns* and *Thistles*) which were before either perfect strangers to, or had been advanc'd to a greater degree of Perfection by the Juices and Warmth of Paradise, became the constant and troublesome Heirlooms there; to the no little regret of our first Parents; who till then had only seen and enjoy'd the better Set of the *Primigenial* Vegetables. And if we consider withal, that a main intention

tion of the Toil, Tillage and Manure of the Husbandman, seems to be design'd to Enspirit and Envigoate the too Cold and Unactive Soil with Warm and Active Particles, we shall not be unwilling to grant, that those Labours of the Husbandman, on this, as well as on several other accounts which might be mention'd, must have been in the *Primitive* state very facile and easie, in comparison of those which are necessary in the *present* state.

S C H O L I U M.

'Twill be here, I imagin, not improper to remind the Reader once for all of the Nature and Effects of that extraordinary *Change*, which the Fall of Man, and the Consequent Curse of God brought upon the Earth: That he may with the greater ease, of his own accord, view and compare the States of External Nature before and after the Fall one with another, and with those things which the Propositions we are now upon do assert concerning them. 'Tis evident then, from what has been before laid down hereto relating, that the *Primitive* state of things before the Fall was thus. The Earth, being newly form'd, was scarcely as yet intirely consolidated, and so pretty uniformly pervious to the warm Steams ascending from beneath. Its Figure was perfectly Spherical, and its *Strata* or *Layers* by consequence were even, continued, and join'd; and so the Central Heat, being equally distant from all the parts of the Earth's Surface, did very equally diffuse it self, and equally affect all the Climates of the Globe. The Soil

Lem. 67,
&c. & Hypoth. 3.
prius.

or Uppermost *Stratum* of the Earth was newly moisten'd by the descent of the Waters, before they compos'd the Seas on the Third Day of the Creation, and by the plenty of Moisture which it still receiv'd every Night. The Air was perfectly Clear, Homogeneous, Transparent, and Susceptive of the utmost Power of the Solar Heat. The Seasons were equable, or gently and gradually distinguish'd from one another, by the Rising, Setting, Descending and Ascending Sun, without any quick Interpositions of Day and Night to disturb them. The *Torrid Zone* of the Earth, as I may call those Regions near the Solar Course, was very much Expos'd to the Sun, and very much warm'd withal by its Vicinage to the Central Solid. The *Moon* in twelve Revolutions equally measur'd out the Year, and caus'd the most gentle, easie, and gradual Tides imaginable. This, with all its natural Consequents, was the State of the *Primitive World*. But as soon as Man had sinn'd and render'd that happy State too good for him, or indeed rendred himself wholly incapable thereof: And as soon as God Almighty had pronounced a Curse on the Ground, and its Productions, presently the Earth began a new and strange Motion, and revolv'd from West to East on its own *Axis*: A single *Νυχθημερον*, or Revolution of Night and Day, either immediately or by degrees, (according as the present Velocity of the *Diurnal Rotation* was suddenly or gradually acquir'd) returned frequently, and became no longer than 24 short Hours; while the *Annual Motion*, perform'd on a different *Axis*, distinguish'd the Seasons, and in Conjunction with the *Diurnal*, describ'd the Equator, and the Tropicks; and by the access and recess of

of the Sun from the last named Circles, caus'd it to visit the several Regions enclos'd thereby. The Face of the Earth was really distinguish'd into *Zones*, by the Tropicks and Polar Circles, truly divided from one another; with respect whereto the particular Regions of the Earth chang'd their Situation; the Equator being that Circle with regard whereto they were now to be determin'd, as they had been before with regard to the Ecliptick; and so that Paradise which was before at the middle, became the Northern boundary of the *Torrid Zone*. The Figure of the Earth, which was before truly Spherical, degenerated into an *Oblate Sphaeroid*; the *Torrid Zone* rising about 10 Miles upward, and the *Frigid* one subsiding as much downwards. The *Compages* of the Upper Earth, and of its *Strata*, became thereby chap'd, broken and divided, and so carried up the warm Steams from beneath, to particular Conceptracles and *Volcano's*, which before serv'd in a more equal and uniform manner to heat and invigorate the intire Earth, and its productions. The Tides, lastly, became frequenter, and so more sudden and violent than before. Which short Summary or Scheme of the States of Nature in our *Hypothesis* before and after the Fall, ought to be all along born in mind, and reflected on, in order to the passing a right judgment on the accounts of those *Phænomena*, in the Solution whereof we are now engag'd: And which otherwise might seem very odd and unaccountable to the Reader. Which being thus dispatch'd, I proceed:

XXIX. The *Primitive* Earth was not equally Paradisical all over. The Garden of *Eden* or Paradise being a peculiarly fruitful and happy soil, and particularly furnish'd with all the necessaries and delights of an

innocent and blessed life, above the other Regions of the Earth.

XXIX. That all the *Primitive* Earth could not be equally Paradisiacal, and enjoy the same Privileges and Conveniences beyond the Present, is easily prov'd. For seeing one of its principal causes of Fertility, and other Prerogatives, was the greater degree of Heat at the Paradisiacal Regions; The Climates near the Solar Course being alone capable of such greater Heat, must be alone capable of its Effects also; and consequently, we are to confine our enquiries for the Garden of *Eden* to the Countries not very remote from the Ancient Ecliptick. Now that some peculiar Spot or Region thereabouts might, beyond all the rest, be Fertile, Pleasant and Paradisiacal, 'tis not difficult to suppose. At the present there is a mighty variety in Countries in the very same Hemisphere, Climate, and Parallel. The particular Prerogatives of one Region beyond another do not intirely depend on the Sun, or the Vicinage of the Central Heat: But partly on the Nature and Temper of the Soil; the kinds of Vegetables and Fossils thereto belonging; the number, qualities, and conflux of Rivers; the firmness or looseness of the inferior *Strata*, hindring, or freelier permitting the ascent of the Subterraneous Steams, Juices, and *Effluvia*: From the coincidence of which, and of other such things, in a peculiar and advantagious manner, order'd and dispos'd on purpose by the Divine Providence at the *Mosaick* Creation, the extraordinary pleasantness and felicity of this Earthly Paradise, or Garden of Pleasure, is I suppose to be deduc'd; and which being consider'd, will, I believe, be sufficient to give satisfaction in the Proposition before us.

XXX. The

XXX. The place of Paradise was where the united Rivers *Tigris* and *Euphrates* divided themselves into four Streams, *Pison*, *Gihon*, *Tigris*, and *Euphrates*.

XXX. This Situation of Paradise has been already consider'd, and need not here be reasum'd. Only we may observe, That no Scruples would ever have been rais'd about this Matter, in case the foremention'd Rivers had still been visible, their Course still agreeable to the *Mosaick* Description, and the Metals and Minerals mention'd of the adjoining Countries had been as evidently there to be found in *ours*, as they appear to have been in those *Primitive* Times. Seeing therefore the following *Theory* will so clearly assign the Cause of such Diversity, that every Reader will be oblig'd to grant it much harder to have accounted for the *Phænomena* of *Paradise*, consistently with the other *Phænomena* of *Nature*, if all things were now as they were at first, than almost any other of the *Antediluvian* World: I may justly hope that this so disputed a Question of the Situation of the Garden of *Eden*, or *Primitive* Paradise, to those who embrace the other parts of the *Theory*, will remain no longer so, but be as fix'd and undoubted, within at least the limits of that *Hypothesis* here referr'd to, as any other Country or Region with the same exactness determin'd by Geography.

Hypoth.
4. prius.

XXXI. The Earth in its *Primitive* State had only an *Annual* Motion about the *Sun*: But since it has a *Diurnal* Rotation upon its own *Axis* also: Whereby a vast difference arises in the several States of the World.

XXXI. This has been at large explain'd and prov'd already.

Lem. 70.
& Hypoth. 3.
prius.

XXXII. Upon

XXXII. Upon the first commencing of this *Diurnal Rotation* after the Fall, its *Axis* was oblique to the Plain of the *Ecliptick* as it still is: or in other words, the present *Vicissitudes* of Seasons, *Spring*, *Summer*, *Autumn*, and *Winter*, arising from the *Sun's* access to, and recess from the *Tropicks*, have been ever since the Fall of Man.

XXXII. This has in some measure been insisted on already in the *Hypothesis* last mention'd, and needs no other direct and positive proof than the present *Obliquity* of the Earth's *Axis*: It being evident, that without a miraculous Power, the same Situation or Inclination which it had originally, would and must invariably remain for all succeeding Ages.

Newt. p.
187.

C H A P. III.

A Solution of the Phænomena relating to the Antediluvian State of the Earth.

XXXIII. The Inhabitants of the Earth were before the Flood vastly more numerous than the present Earth either actually does, or perhaps is capable to maintain and supply.

XXXIII. **T**HIS Proposition will not appear strange, if we consider, (1.) The much greater fertility of the *Antediluvian* Earth, to be presently accounted for; whereby it was capable of maintaining a much greater number of Inhabitants than the present, even on the same space of Ground. (2.) The Earth was more equally habitable all over before, than since the Deluge.
For

For before the acquisition of those heterogeneous mixtures, which the Deluge occasion'd, and which I take to be the Causes of all our violent and pernicious Heat and Cold in the *Torrid* and *Frigid Zones* of our Earth; 'tis probable the Earth was pretty equally habitable all over, by reason of the Vicinage of the Central Heat to the *Polar Regions*, and the more direct Exposition of the middle Regions to that of the *Sun*. I do not mean that the *Frigid Zones* were equally hot with the *Torrid*; but that the Heat in the one, and the Cold in the other, were more kindly; and the excesses of each much less considerable than at present, since the Introduction of the before-mention'd Mixtures, and particularly of such Sulphureous and Nitrous *Effluvia*, as are now, I believe, become Calorifick and Frigorifick Particles in our Air, the main occasions of the violence and pernicious Qualities of the Heat and Cold thereof, and the most affecting to our Senses of all other. So that 'tis probable, before the Acquisition of these *Adventitious* Masses, the *Antediluvian* Air was every where sufficiently temperate to permit the comfortable Habitation of Mankind on all parts of the Globe; and the *Antediluvian* Earth was by consequence capable of many more Inhabitants than the present is, or can be; as every one will readily grant, who considers how few Inhabitants, in comparison, three of the five Zones of our present Earth do maintain. (3.) The dry Land or habitable Earth it self was, by reason of the absence of the intire Ocean, full as large and capacious again as the present: For the Ocean, I think, takes up now at the least one half of the intire Globe; but then afforded as large, spacious, and habitable Countries, as the other parts of the Earth.

(4.) The

(4.) The Mountains which are now generally bare and barren, were before the Deluge, so far as they were suppli'd with Water, as fruitful as the Plains or Vallies; and by reason of a larger Surface, were capable of maintaining rather more Animals than the Plains, on which they stand, would otherwise have been: The present defect of a fruitful Soil being owing to the Deluge; and there being no good reason, that I know of, to be assign'd why, on a primary Formation, and in a calm and still State of the Air, the higher Parts of the Earth should not be cover'd with a fruitful Soil or Mold, as well as the level or lower adjoining to them. All which Accounts taken together, will, I think, give reasonable Foundation for such vast numbers of Inhabitants, as according to the Computation of this Proposition, the *Antediluvian* World was replenish'd withal.

Corollary 1. Since by very reasonable Computations of the numbers of the Inhabitants of the Earth at the Deluge, according to the Hebrew Chronology, they appear to have been sufficient abundantly to replenish the intire Globe, and as many as in reason the same could sustain; The Septuagints addition of near six hundred Years in this Period of the World to the Hebrew Accounts, is so far from clearing Difficulties thereto relating, that it rather increases the same, and enforces the allowance of more Inhabitants at the Deluge, than we can well tell where they could live and be maintain'd.

Coroll. 2. Since according to the Hebrew Chronology from the Deluge till the time of Abraham's going into Canaan, was the intire space of 427 Years, and the Lives of Men during that interval were in a mean three hundred Years long; 'tis easy on the Grounds proceeded upon in this Phenomenon's Calculations,

lations, to prove, That there is no need to recede from that Account, or introduce the additional Years of the Septuagint in this Period, to produce the greatest Numbers of Men which in that, or the immediately succeeding Ages, any Authentick Histories of those Ancient Times do require us to suppose.

Coroll. 3. *The Deluge which destroy'd the whole Race of Mankind (those only in the Ark excepted) could not possibly be confin'd to one or more certain Regions of the Earth, but was, without question, truly Universal.*

Coroll. 4. *Seeing it appears, That Mankind has a gradual increase, and that in somewhat more than four thousand Years, our Continent of Europe, Asia, and Africa, has been so entirely Peopled from the Sons of Noah; and seeing withal America is much less in extent, and, I suppose, generally speaking, was never so full of People: In case we suppose that Famines, Wars, Pestilences, and all such sad destroyers of Mankind have equally afflicted the several Continents of the Earth, Some light might be afforded to the Peopling of America, and about what Age since the Deluge, the American's past first from this Continent thither; which a more nice enquiry into the Particulars here to be consider'd might assist us in,*

XXXIV. The Bruit Animals, whether belonging to the Water or Land, were proportionably at least, more in number before the Flood than they are since.

XXXIV. That part of this Proposition which concerns the Dry-land Animals, is sufficiently accounted for, by what has been discours'd under the last Head, which equally belongs to them as to Mankind: And if we extend the other part concerning the Fishes, to the Seas then in Being, and their comparative Plenitude, there will need no additional Solution. It being not to be supposed

pos'd that the absolute numbers of Fish before the Deluge, should be greater than at present, as the case was of the Dry-land Animals; because the latter being universally destroy'd, (those in the *Ark* alone excepted) were to begin their Propagation anew; but the former not being so, did but increase their still numerous Individuals, and must thereby soon recover and surpass their former Multitude, as will easily be allow'd on a little consideration of this Matter.

Corollary. Hence arises a strong Confirmation of what is on other grounds already asserted, That there were only smaller Lakes and Seas, but no great Ocean before the Deluge. For since it appears by this Phenomenon, that the Waters of the Antediluvian Earth were much more replenish'd, nay, crowded with Fish than now they are; and since there was no general Destruction of them, as there was of Dry-land Animals at the Deluge; had there been as great a Compass, or as vast an Ocean for their Reception then, as at present there is, the numbers now in every part of the Ocean or Seas, ought to be vastly greater than they then were, as being all the Off-spring of those which every where surviv'd the Deluge, and which have propagated themselves for more than four thousand Years since the same; which being disagreeable to the Observations referr'd to in this Phenomenon, is little less than a Demonstration of the falshood of that Hypothesis on which 'tis built, or a full Attestation to our Assertion, that there were only smaller Lakes and Seas, but no great Ocean before the Deluge.

XXXV. The *Antediluvian* Earth was much more fruitful than the present; and the multitude of its vegetable Productions much greater.

XXXV. Before

XXXV. Before I come directly to solve this and the following Propositions, I must premise, that 'tis usually unreasonable to ask, why such *Phænomena* belong'd to the *Antediluvian* World: They being commonly but the natural and regular Properties of an Original Earth, newly form'd out of a *Chaos*; such as one should rationally expect in a World newly come out of the Hands of its Creator, and fitted for the Convenience and Fruition of noble Creatures; such as the generality of our fellow Planets, (especially our next Neighbour, the *Moon*) as far as we can observe, appear to have had at first, and hitherto retain'd. All that can in reason be desir'd, is this, To give a plain and intelligible Account of those opposite *Phænomena* of the Earth, which we *now* are sensible of, and by what means the Deluge could occasion the same. Which therefore shall be frequently the business of the succeeding Solutions. And as to the present case, the decrease of the Fertility of the Earth at the Deluge, these Causes are assignable, (1.) The decrease of the *Sun's* Heat by the greater distance of the Earth from him since, than before the Deluge. It has been before prov'd, that till the Deluge, the Earth's Orbit was Circular, and the *Radius* of that Circle very little longer than the nearest distance at the *Perihelion* now: So, that when the Heat of the *Sun* is as the density of his Rays, or *reciprocally* as the Squares of the Earth's distance from him: If instead of the present *Ellipsis* we take, for Calculations sake, as we ought, a Circle in the middle between the nearest and farthest distance, we shall find that the *Sun's* Heat on the Earth in general before the Deluge, was to its present Heat, as almost a hundred to ninety six, or a twenty fifth part

part of his intire Heat greater before than since the same, which is by no means inconsiderable in the Case before us. (2.) The Heat of the Central Body was considerably damp'd and obstructed, both by the Waters of the Deluge themselves, acquir'd from abroad, and now contain'd in the Pores and Caverns of the Earth under us; and by that Sediment of them which now composes that upper Crust of Earth we dwell upon, and which being settled and consolidated on the Superficies of the Ancient Earth would prove a great hindrance to the ascending Steams, not to be overcome but by degrees, and in length of time afterwards. From both which Causes very a notable Damp would be put to the Influence of the Central Heat, on which as well as on the *Sun's*, the Fertility of every Soil does in part depend. (3.) The upper Earth, or fruitful Soil it self, the main Fund and Promptuary of the vegetable Kingdom, is now very inconsiderable in quantity, if compar'd with that of the *Primitive* or *Antediluvian* Earth. For when this last mention'd was the intire product of the Ancient *Chaos* at the original Formation of the Earth, and the first, what only was afforded from a small part of such a *Chaos*, the Comet's *Atmosphere*, and by the Storms born off the Tops of Mountains at the Deluge, while the old Soil lies buried under the Sediment or Crust on which we live; 'tis no wonder that our fertile *Stratum* is now thinner spread, and so the Productions less copious in the present, than they were in the *Antediluvian* State of Things. And this, tho' we suppose the Soil from the Comet, or from the Tops of the Mountains, to be as good in it self, and to have remain'd as pure and unmix'd with any heterogeneous Matter in this confusion of things

things at the Deluge, as it would at the regular Formation of the Earth at first; which yet is by no means supposable; and the contrary to which being allow'd for, will still farther afford us a reason of the present Assertion. So that since the present Soil is both much worse in Quality, and much less in Quantity than the old one; and since the Heat, whether of the *Sun* or *Central Solid* is so much lessen'd at the Deluge, which things include the main Causes of Fertility; 'tis no wonder that the *present* Earth is nothing near so fruitful and luxuriant in her Productions, as the *Antediluvian* was.

XXXVI. The Temperature of the *Antediluvian* Air was more equable as to its different Climates, and its different Seasons; without such excessive and sudden Heat and Cold; without the scorching of a *Torrid Zone*, and of burning *Summers*; or the freezing of the *Frigid Zones*, and of piercing *Winters*; and without such sudden and violent changes in the Climates or Seasons from one extreme to another, as the present Air, to our Sorrow, is subject to.

XXXVI. Seeing the primary State here mention'd, is but a proper result from the first Formation of the Earth; all that need be accounted for, is the Alteration at the Deluge. (1.) The mighty difference of Climates, especially of the *Torrid* and *Frigid Zones*, is, I suppose, owing not wholly to the *Sun's* Heat, or the Nature of the Air it self, but partly to those Calorifick and Frigorifick Mixtures, which are uncertainly contain'd therein. Meer Heat and Cold are very different things from that Pothery and Sultry, that Frosty and Congealing Weather, which alternately in *Summer* and *Winter*, at the *Line* and the *Poles* we usually now feel. These Effects seem plainly deriv'd from Nitrous or Sulphu-

C c

reous,

reous, or other the like Steams exhaled into, mixed with, and sustained by that thick and gross *Atmosphere* which now encompasses the Earth. All which, I mean as well the gross *Atmosphere* it self, as those its Heterogeneous Mixtures, are a very natural Off-spring of the Deluge, according to the present Account thereof. For seeing we at that time pass'd clear through the *Chaotick Atmosphere* of a Comet, and through the Tail deriv'd from it, we must needs bear off, and acquire vast quantities of such heterogeneous and indigested Masses, as our Air now contains in it; whence those Effects here mention'd would naturally proceed. 'Tis probable the original Air was too pure, rare, and thin, to sustain any gross and earthy Particles, tho' they had been left in it at the first; and so its Heat both for kind and degree, was no other than the proper Place and Influence of the *Sun* could require: And 'twas *then* sure more uniform through the several Climates of the Earth than *now* it is; when our Air in the *Torrid Zone*, being full of Sulphureous and Sultry, and in the *Frigid* ones of Nitrous and Freezing *Effluvia* or Exhalations, the violence of an unkindly in Heat the one, and of the like unkindly Cold in the other, are so sensible, and so pernicious, as all experience attests them now to be. (2.) The uncertainty of our Seasons, with the sudden and unexpected changes in the Temper of our Air, are on the same accounts equally visible with the former. For the Temper of the Air since the Deluge, especially with regard to our Sensations, not resulting from the external Heat only, but from the Kinds and Quantities of its heterogeneous and adventitious Mixtures, will not now depend on the Season of the Year alone, but on the veering

veering of the Wind, and its uncertain removal of the Air and its Steams from one Region to another. Thus if in *Summer* the *North* Wind chance to blow any long time together, 'twill bring along with the Air so great quantities of the Cold, Freezing, Nitrous Steams, as may quite overcome the *Sun's* Heat, and cause a very cold Season of a sudden; if the *South* Wind do the like in the *Winter*, the contrary Effect will follow, and we shall have a warm Season when Frost and Snow were more naturally to be expected. Thus, accordingly, frequent experience shews the *Sun* to be so little master of the Seasons of the Year, that sometimes *January* and *July* for several Days are hardly distinguishable. It sometimes happens, that we have this Day a Frost, the next proves so warm, that the former Cold is forgotten, till perhaps the succeeding Night puts us more affectingly in mind of it again. Nay, in a very few Hours space a sultry and a freezing Air not seldom do succeed each other, to the great harm and misery of Mankind, and of all their fellow Animals in our present State; from which therefore we have good reason to believe our happier Progenitors before the Deluge were intirely free. (3.) That our Seasons are so extream in their several Kinds, is easy to be hence accounted for also. For were there no sulphureous or calorifick Steams in the Air, all pothery and sultry Weather, and such sort of Heat as chiefly affects our Bodies, would be quite avoided, and the great increase thereof after the *Summer Solstice*, which arises, 'tis probable, in part from the Airs retention of one days Heat, till the next augments it again, would in good measure cease among us. And the like is to be said of the Cold in *Winter*, in all the respects

C c 2

before-

before-mention'd. The original of all which Effects being so easily deducible from the present Account of the Deluge, 'tis no question but the *Antediluvians* might, to their comfort, be wholly Strangers to them. Their Climates were not of so very different Temper; their Seasons leisurely and gradual, intirely following the Solar Course; And their *Summers* and *Winters* not so mighty different; at the most in the single Proportion of the *Sun's* Presence or Absence, Direct or Oblique Situation. In this equable State the *Polar* Inhabitants might with little danger cut the *Line*, and the *Ethiopians* visit the *Frigid Zones*. In this condition of the World, the peculiar Air of every Country went not far from home, to disturb that of others: A few Days never made any sensible Alteration in the temperature of the Air; and all that an intire *Spring* or *Autumn* could do, would still leave the same pretty equable, to be sure very tolerable. On all which, and several other consequential Accounts, we have but too much reason to envy the Ancient Happiness of our Forefathers, and to be sensible of that fatal and destructive *Catastrophe*, which the wickedness of Mankind brought upon themselves, and all their Posterity to this very Day, at the Deluge we are now speaking of.

XXXVII. The Constitution of the *Antediluvian* Air was Thin, Pure, Subtile and Homogeneous, without such gross Steams, Exhalations, Nitrosulphureous, or other Heterogeneous Mixtures, as occasion Coruscations, Meteors, Thunder, Lightning, with Contagious and Pestilential Infections in our present Air; and have so very pernicious and fatal (tho' almost insensible) Effects in the World since the Deluge.

XXXVII. The

XXXVII. The consideration of the foregoing *Solution* is sufficient to clear the present *Phænomenon* also; to which therefore the *Reader* is re-ferr'd.

XXXVIII. The *Antediluvian* Air had no large, gross Masses of Vapours or Clouds, hanging for long seasons in the same. It had no great round drops of Rain, descending in multitudes together, which we call Showers: But the Ground was watered by gentle Mists or Vapours ascending in the Day, and descending, in great measure, again in the succeeding Night.

XXXVIII. This is also easily understood from what has been already said. So rare, thin, pure, and subtile an Air as the *Antediluvian* was, would scarce sustain such gross and heavy Masses, as the Clouds are: It would not precipitate the superior Vapours upon the inferior in such quantities, and with such violence, as is necessary to the Production of great round sensible Drops of Rain: It had no gross Steams to retain Heat after the cause of it was gone, and the *Sun* set; and so the Vapours which were rais'd in the Day, would descend again in the Night, with the greatest regularity and gentleness. In all which respects the different Nature, Crassitude, and irregular Composition of our present gross *Atmosphere*, acquir'd at the Deluge from the *Comet's*, in which such Opaque Masses, as the Clouds, are frequently to be observ'd, must naturally admit and require those contrary Effects, which the present Proposition takes notice of, and were to be here accounted for.

XXXIX. The *Antediluvian* Air was free from violent Winds, Storms, and Agitations, with all their Effects on the Earth and Seas, which we cannot but now be sufficiently sensible of.

C c ;

XXXIX. These

XXXIX. These *Phænomena* are such proper consequents of a Primitive Formation, and the original of those opposite ones ever since the Deluge so naturally thence to be deriv'd, that there is no reason to imagine them to have been before. A Comet's *Atmosphere* is a very stormy Fluid, wherein Masses of Opaque Matter are continually hurried about, all manner of ways, in a very uncertain and violent manner. Seeing therefore we acquir'd at the Deluge so great a quantity of the same *Atmosphere*, of which ours is now in part compos'd, 'tis impossible to expect any other State of things than such as this *Phænomenon* mentions, and was to be here accounted for.

Gen. iii. 8. Margin. Corollary. Hence it appears, That the Wind of the Day, of which Moses makes mention at the Fall of Man, was not a constant *Phænomenon* of the Earth, but peculiar to that time. And this is very agreeable to the Hypothesis before laid down of the commencement of the Diurnal Rotation at the very Day here mention'd; according to which, a Wind must necessarily arise at that point of Time, tho' there were none before or after, till the Deluge. On that beginning of the Diurnal Rotation. (1.) The Equatorial Regions would be elevated, the Polar depress'd, the Orb of Earth would be chap'd and broken, and warm Steams burst out at the Fissures thereby produc'd; all which could scarce happen without some Agitation of the Air. But, (2.) What is more certain and more considerable, when the Terraqueous Globe began on a sudden to revolve from West to East, the Air could not presently accompany it, and so must cause a Wind from East to West; till receiving by degrees the Impression, it kept at last equal pace therewith, and resting respectively, caused a constant Calm afterwards. Which Wind being therefore (from the Earth's Velocity there) greatest towards the Equator and Tropicks,

picks, near the latter of which was the place of Paradise, would be considerable enough, especially in a state otherwise still and calm, to be taken notice of by the Sacred History; and be a kind of Relick or Footstep of the then Commencement of that Diurnal Rotation, which is so necessary to account for it, and has been from other Arguments already prov'd in its proper place.

XL. The *Aurediluvian* Air had no *Rain-bow*; as the present so frequently has.

XL. This is easily accountable from what has been already said. For, (1.) The descent of the Vapours necessary to it was usually, if not only in the Night when the absence of the *Sun* rendred its appearance impossible. (2.) The descending Vapours compos'd only a gentle Mist, not sensible round Drops of Rain, as we have before seen, on which yet the *Rain-bow* entirely depends; as those who understand the Nature and Generation thereof will easily confess. So that tho' the *Sun* were above the Horizon at the fall of the Vapours, the appearance of the *Rain-bow* was not to be expected. (3.) Were the Vapours that fell compos'd of sensible round Drops, and fell in the day-time, and this in sufficient Quantities, yet for want of a Wind which might drive them together on one side, and thereby clear the Air on the other, for the free admission of the Rays of Light, a *Rain-bow* were seldom or never to be suppos'd before the Deluge; all which circumstances being now quite otherwise, give us clear reasons for the present frequent appearance of that beautiful and remarkable *Phænomenon*, tho' till the Deluge, it was a perfect Stranger to the World.

XLI. The *Antediluvians* might only eat Vegetables; but the Use of Flesh after the Flood was freely allow'd also.

XLI. That a State of Nature as to the Air, Earth, Fruits, and other circumstances so very different from ours at present, should require a suitable difference in the Food and Sustainance of Mankind, is very reasonable to believe. But besides, (1.) When the Lives of Animals were naturally so long, (as in correspondence to Mankind is fairly to be suppos'd) before the Deluge; 'tis not improbable that God Almighty would not permit them to be taken away on any other occasion than that of Sacrifice or Oblation to himself. (2.) Perhaps in the tender and even Condition of the *Antediluvians*, the eating of Flesh would have spoil'd their Tempers, and shortened their Lives; such Food being, I suppose, fitter for our gross and short-liv'd State since the Flood, than that refin'd and lasting one before it. (3.) Perhaps the *Antediluvian* Vegetables were more juicy, nourishing, and wholesome, not only than Flesh, but than themselves have since been; which the better and more fertile Soil out of which they grew then, gives some reason to conjecture. And whether they had not then some Vegetables which we have not now; may deserve the consideration of such as search after their remains in the Bowels of the Earth: The same care of the Vegetable, as of the Animal-Kingdom not appearing in the Sacred History relating to the Deluge. However, (4.) If we observe that even at this day, the warm Seasons and Countries are less dispos'd to the eating of Flesh than the cold ones; and remember that the *Antediluvian* Air was in some degree

degree warmer than the present, we shall not be wholly to seek for a particular reason of this *Phænomenon*. Solut. 35. prius.

XLII. The Lives of the *Antediluvians* were more universally equal, and vastly longer than ours now are: Men before the Flood frequently approaching near to a thousand, which almost none now do to a hundred years of Age.

XLII. Tho' several other things might here deserve to be consider'd, yet I shall only insist upon the difference between the *Antediluvian* Air, and that since the Flood, to give an account of this Proposition. The consideration of the Pure, Unmixed, Equable, and Gentle Constitution of the former; compar'd with the Gross, Thick, Heterogeneous, Mutable, and Violent Condition of the latter, of it self affording a sufficient Solution of this difficulty. That Air which is drawn in every breath; whose included Particles, 'tis probable, insinuate themselves continually into our Blood, and the other Fluids of our Bodies; and on which all experience shews humane Life and Health exceedingly to depend; being at the Deluge chang'd from a Rare and Thin, to a Thick and Gross Consistence; from an equability or gradual and gentle warmth and coolness of Temperature, to extremity of Heat and Cold; and that with the most sudden and irregular steps from one to another; from True and Pure Air, or an Homogeneous Elastical Fluid, to a mix'd and confused *Compositum* or *Atmosphere*, wherein all sorts of *Effluvia*, Sulphureous, Nitrous, Mineral and Metallick, &c. are contain'd. Which circumstances, if there were no other, will, I imagine, give a satisfactory account of the mighty difference

rence as to the point of Longevity between the *Antediluvians* and those which ever since have dwelt on the Face of the Earth. We may obtain some small and partial resemblance of it in a person who had liv'd many years upon the top of a high Mountain, above the Clouds and Steams of our Earth, and whose temperament of Body was peculiarly dispos'd for so Pure, Thin, and Undisturb'd an *Aether* as there he enjoy'd; and afterward were confin'd to the most Foggy, Marshy, and Stinking part of the Hundreds in *Essex*, or of the Bogs in *Ireland*. What Effect in Point of Life and Health such a Change must have on the Person before-mention'd, 'tis not difficult to imagine: And as easie, on a like comparison of the *Antediluvian Aether*, and the present *Atmosphere* to account for the Proposition before us; and shew as well why men dye at all uncertain Periods of Years, and have while they live a Precarious State of Health, with frequent sicknesses; as why none reach any whit near the long Ages of those that before the Deluge continued in Health and Security for near a thousand Years.

XLIII. Tho' the *Antediluvian* Earth was not destitute of lesser Seas and Lakes, every where dispers'd on the Surface thereof; yet had it no *Ocean*, or large receptacle of Waters, separating one Continent from another, and covering so large a portion of it, as the present Earth has.

XLIII. From the Original Formation of the Earth above describ'd, and its unequal subsidence into the *Abyss* beneath, while in the mean time vast quantities of Vapours were sustain'd above, and afterwards let fall upon the Earth, its Surface would be unequal; its lowest Valleys fill'd with
Water;

Water; and a truly *Terraqueous Globe* would arise. But these two plain Reasons may be assigned why any great Ocean were not to be expected at the same time. (1.) So Vast and Deep a Valley as the Ocean implies, is not in reason to be deriv'd from such a regular formation of the Earth from a *Chaos*, as we have above describ'd. No good reason being assignable, why in such a confused mixture as we call a *Chaos*, the parts should be so strangely dispos'd, that on one side, all the Upper Orb for some scores of Degrees, and some thousands of Miles together, should be Denfer and Heavier than the rest, and by its sinking deepest into the *Abyss*, produce the vast Channel of the Ocean; while on another side the same Orb, for as many Degrees and Miles, should be universally Rare and Light enough to be very much extant, and compose a mighty Continent, as the case is in our present Earth. Tho' the *Atmosphere* of a Comet, be so truly Heterogeneous, and its Opake or Earthy Masses so unequally scatter'd abroad on the different sides thereof, as even, setting aside the inequality of the Density and Specifick Gravity of the several Columns, might compose an Orb of different Thickness or Crassitude, and so cause an unequal Orb on the Face of the *Abyss*, like that we before suppos'd it originally to have been; Yet so mighty an inequality, as the present Division of the Earth into an Ocean and Continents must suppose, is by no means to be allow'd in the Primitive *Chaos*; nor would I suppose by any be asserted, if the Generation of those grand Divisions of our Globe were otherwise accountable: which on our Principles being so easily done, as will soon appear, no reason can plead here for their *Primitive*

tive Introduction. And sure those Agitation and Motions of Parts visible in some sort now in Comets *Atmospheres*, and to be however granted in the digestion of its parts at first, must sure mix and jumble the parts together to a degree sufficient to prevent so strange an inequality, as the Original Existence of the Ocean and Continents must needs imply. However (2.) The quantity of Water preserv'd above ground was little or nothing more, as we have shew'd, than the Heat of the Sun and Central Solid was able to elevate, and the Air at once to sustain, during half a years space; the day time of the second Period of the Creation: Which how insufficient it must have been to the filling of the great Ocean, is easily understood. Which things consider'd, the Absence of the Ocean, as well as the Existence of Seas, is very easily accountable in the *Antediluvian* World.

CHAP. IV.

A Solution of the Phænomena relating to the Universal Deluge, and its Effects upon the Earth.

XLIV. In the Seventeenth Century from the Creation, there happen'd a most extraordinary and prodigious Deluge of Waters upon the Earth.

XLIV. **W**Hatever difficulties may hitherto have rendred this most Noted *Catastrophe* of the Old World, that it was destroy'd by Waters, very hard, if not wholly inexplicable

explicable without an Omnipotent Power, and Miraculous Interposition; since the Theory of Comets, with their *Atmospheres* and *Tails* is discover'd, they must vanish of their own accord. For if we consider that a Comet is no other than a *Chaos*; including the very same Bodies, and Parts, of which our own Earth is compos'd; that the outward Regions of its *Atmosphere* are plain Vapours, or such a sort of Mist as we frequently see with us; and the *Tail* a column of the same Vapours, rarified and expanded to a greater degree, as the Vapours which in the clearest Days or Nights our Air contains at present, are; and that withal such a Comet is capable of passing so close by the Body of the Earth as to involve it in its *Atmosphere* and *Tail* a considerable time, and leave prodigious quantities of the same Condensed and Expanded Vapours upon its Surface; we shall easily see that a Deluge of Waters is by no means an impossible thing; and in particular that such an individual Deluge as to the Time, Quantity, and Circumstances which *Moses* describes, is no more so, but fully accountable, that it *might* be, nay almost demonstrable that it really *was*. All which the *Solutions* following will I think give an easie and mechanical account of.

Vid. Fig.
1, & 4,
& 7.

XLV. This prodigious Deluge of Waters was mainly occasion'd by a most extraordinary and violent Rain, for the space of forty Days, and as many Nights, without intermission.

XLV. When the Earth passed clear through the *Atmosphere* and *Tail* of the Comet, in which it would remain for about 10 or 12 hours (as from the Velocity of the Earth, and the Crassitude of the said *Tail* on Calculation does appear)

it must acquire, from the violence of the Column of Vapours descend towards the Sun, impeded by the Earth's Interposition and Reception of the same; and from the Attractive Power of the Earth it self withal, enforcing more to descend; it must, I say, acquire upon its Surface immense quantities of the Vapours before mention'd. A great part of which being in a very Rare and Expanded condition, after their Primary Fall, would be immediately mounted upward into the Air, and afterward descend in violent and outrageous Rains upon the Face of the Earth. All those Vapours which were rarer and lighter than that Air which is immediately contiguous to the Earth, must certainly ascend to such a height therein, where its Density and Specifick Gravity were correspondent (as far as that Croud of their fellow Vapours, with which the Air was oppress'd would give leave;) And so afterwards, as they cool'd, thicken'd, and collected together, like our present Vapours must descend in most prodigious Showers of Rain for a long time afterwards, and very naturally occasion that forty Days and forty Nights Rain mention'd in the Proposition before us.

XLVI. This vast quantity of Waters was not deriv'd from the Earth or Seas, as Rains constantly now are; but from some other Superior and Cœlestial Original.

XLVI. This is already evident from what has been just now said: The source of all these Rains being one of those Superior or Cœlestial Bodies which we call *Comets*; or more peculiarly the *Atmosphere* and *Tail* thereof.

XLVII. This vast Fall of Waters, or forty Days Rain, began on the fifth day of the Week, or *Thursday* the twenty

twenty seventh day of *November*, being the seventeenth day of the second Month from the *Autumnal Equinox*; (corresponding this Year 1696. to the twenty eighth day of *October*.)

XLVII. This has been already explain'd in effect, in the *Hypothesis* hereto relating; where it was prov'd that a Comet on that very day here nam'd pass'd by the Earth; and by consequence began those Rains which for the succeeding forty days space continued without any Interruption. Hypoth. 10. prius.

XLVIII. The other main cause of the Deluge, was the breaking up the Fountains of the great *Abyss*, or causing such Chaps and Fissures in the upper Earth, as might permit the Waters contain'd in the Bowels of it when violently press'd and squeez'd upwards, to ascend, and so add to the quantity of those which the Rains produced.

XLVIII. This has in part been explain'd in the *Lemmata* hereto relating; and will be more fully understood from the Figure there also refer'd to. For Let a d b c represent the Earth, moving along the Ecliptick G H, from G towards H. 'Tis evident that the Figure of the Earth before the approach of the Comet, as far as 'tis here concern'd, was Spherical. But now, let us suppose the Comet b i D h (as it was descending towards its *Perihelion*, along its *Trajectory* E F, from E towards F) to approach very near, and arrive at the nearest Position, represented in the Figure. 'Tis evident that this presence of the Comet would cause a double Tide, as well in the Seas above, as in the *Abyss* below; the former of which being less considerable in it self, and not to our present purpose, need not be taken any farther notice of: But the Lem. 83, 83. prius. Fig. 7.

Vid.
Schol.
post Hy-
poth. 10.
prius.

Lem. 82.
prius.

the latter would be vastly great, (suppose seven or eight Miles high above its former Position) would produce mighty Effects on the Orb above it, and so deserves a nicer Consideration in this place. As soon therefore as the Comet came pretty near, (as suppose within the *Moon's* distance) this double Tide would begin to rise, and increase all the time of its approach, till the Comet was nearest of all, as in the Figure. And then these Tides, or double Protuberances of the *Abyss*, would be at their utmost height. So that the Surface of the *Abyss*, and of its incumbent Orb of Earth, would put on that *Elliptick*, or rather truly and exactly *Oval* Figure, under which 'tis here represented. Now, 'tis certain, that this *Sphaeroid* Surface of the *Abyss* is larger than its former *Spherical* one; 'tis also certain, that the Orb of Earth which rested on this *Abyss*, must be oblig'd to follow its Figure, and accommodate it self to this large *Oval*; which being impossible for it to do while it remain'd Solid, continued, and conjoyn'd, it must of necessity enlarge it self, and by the violent force of the encreasing Surface of the *Abyss* be stretch'd, crack'd, broken, and have innumerable *Fissures* made quite through it, from the upper to the under Surface thereof, nearly *perpendicular* to the same Surfaces. So that this Orb of Earth which originally, in its primary formation, was *Spherical*; its inward Compages or *Strata* even, conjoin'd, and continual; which had afterward, at the commencing of the *Diurnal Rotation*, been chang'd into an *Oblate Sphaeroid*, and at the same time been thereby broken, chap'd, and disjointed; by that time its wounds had been well healed, and it was in some measure settled, and fix'd in such a condition, receiv'd this new Disruption at the Deluge.

luge. Its old Fissures were open'd, and the Fountains of the *Abyss* (most Naturally and Emphatically so stil'd, according to Dr. *Woodward's* Account of the Origin of Fountains) broken up; and sufficient Gaps made for a Communication between the *Abyss* below, and the Surface of the Earth above the same, if any occasion should be given for the Ascent of the former, or Descent of any thing from the latter. And here 'tis to be noted, that these Chaps and *Fissures*, tho' they were never so many or so open, could not of themselves raise any Subterraneous Waters, nor contribute one jot to the drowning of the Earth. The Upper Orb was long ago settled, and sunk as far into the *Abyss* as the Law of *Hydrostaticks* requir'd; and whether 'twere intire or broken, would cause no new pressure; and no more than maintain its *prior* situation on the Face of the Deep. These *Fissures* had been at least as open and extended in their Original Generation, when the *Diurnal Rotation* began, as at this time, and yet was there no danger of a Deluge. So that tho' this breaking up of the Fountains of the Deep was a prerequisite condition, and absolutely necessary to the Ascent of the Subterraneous Waters, yet was it not the proper and direct cause or efficient thereof: *That* is to be deriv'd from another original, and is as follows. As soon as the presence of the Comet had produc'd those vast Tides, or double elevation and depression of the *Abyss*, and thereby disjointed the Earth, and caus'd the before-mention'd patent holes or breaches quite through the Body of it, the Fall of Waters began, and quickly cover'd the Earth, and crowd'd the Air with vast quantities thereof: Which Waters being adventitious or addi-

Vid Essay
Pa. 121,
&c. and
Pa. 132.

Lem. 75,
76. prius.

Solut. 6
prius.

tional ones, and of a prodigious weight withal, must press downward with a mighty force, and endeavour to sink the Orb of Earth deeper into the *Abyss*, according as the intire weight of each column of Earth, and its incumbent Waters together, agreeably to the Law of *Hydrostaticks*, did now require. And had the Earth, as it was in its first subsiding into the *Abyss*, been loose, separate, and unfix'd, so as to admit the *Abyss* between its parts, and suffer a gentle subsidence of the Columns of Earth in the requisite proportion, we could scarce have expected any Elevation of the Subterraneous Waters. But the *Strata* of the Earth were long ago settled, fastened, and consolidated together, and so could not admit of such a farther immersion into the fluid. On which account the new and vast pressure of the Orb of Earth upon the *Abyss* would certainly force it upward, or any way, wheresoever there were a passage for it: To which therefore the Breaches, Holes, and *Fissures* so newly generated, or rather open'd afresh by the violence of the Tides in the *Abyss* beneath, would be very ready and natural Outlets; through which it would Ascend with a mighty force, and carry up before it whatever was in its way, whether Fluid or Solid, whether 'twere Earth or Water. And seeing, as we before saw, the Lower Regions of the Earth were full of Water, pervading and replenishing the Pores and Interstices thereof; which Waters on the opening of the *Fissures* would from all sides ouze into, and fill up the Inferiour parts of the same, and rest upon the Face of the *Abyss*; the *Dense Fluid* of the *Abyss*, in its violent Ascent through the *Fissures*, would carry before it, and throw out at the tops of the said *Fissures* great quantities

ties of the same; and if its force were any where sufficient, would cast it self also out at the same passages; and by both or either ways would mightily add to the quantity of the Waters already on the Face of the Earth, and become a fresh and a prodigious augmentation of that Deluge, which began already to overwhelm and destroy the Inhabitants thereof. For the better apprehension of this matter, let us imagine the following Experiment were made. Suppose a *Cylinder* of Stone or Marble fitted so exactly to a hollow *Cylindrical* Vessel, that it may just Ascend or Descend freely within it: Let the *Cylinder* of Stone or Marble have small holes bored quite through it, parallel to the *Axis* thereof: Let the Vessel be fill'd half full of Water; and the *Cylinder*, as gently as you please, be put into the Vessel, till it touch the Water: Let then each of the holes through the *Cylinder* be fill'd in part with Oyl, or any other Fluid lighter than the Water, to Swim upon the Surface thereof: Things being thus provided, you have the very case of the Deluge before you; and what effects you here, in a lesser degree, will observe, are but the representations of those great and remarkable ones of which we are now speaking. For as the weight of the *Cylinder* pressing upon the Surface of the Water would squeeze the Oyl upon its Surface through the holes, and cast it out thereat with some violence, and cast it self too out at the same passages if the holes were not too high, in comparison to the quantity of the intire pressure upon the Surface of the Water; just so the Weight of the Columns of Earth, augmented by the additional Waters of the Comet, would squeeze and press upon the Surface of the *Abyss*; which being a

Newt. p.
290, &c.

Fluid Mass, and incapable of sustaining a pressure in one part; without equally communicating it to all the rest, any way whatsoever; must burst out wherever such pressure was wanting, and throw it self up the *Fissures*; carrying up before it, and throwing out upon the Earth those Waters which (like Oyl on the Water in the Experiment) lay upon its Surface, and for the altitude perhaps of some Miles cover'd the same; and thereby mightily increasing the greatness of the Deluge, and having a main stroke in that destruction which it brought upon the Earth. All which, I think, gives us a clear, easie, and mechanical account of this (hitherto inexplicable) *Secondary Cause* of the Deluge, the breaking up the Fountains of the Great Deep, and thereat the elevating the Subterraneous Waters, and bringing them out upon the Face of the Earth.

Corollary 1. *These Chaps or Fissures at the Deluge would commonly be the same with those at the commencing of the Diurnal Rotation. It being easier to break the Compages of the Earth where it had once been broken already, and was never united well again, than in other places where it was intire and continued: And those parts which sustain'd the rather greater force at the former Convulsion, would at least as well sustain this, of which we are now speaking, and preserve their former continuity still, as they did before the Flood.*

Coroll. 2. *Hence if these Fissures are the occasion and source of Fountains, as Dr. Woodward very probably asserts, The Antediluvian and Postdiluvian Springs must be generally the very same; as arising from the same Originals; so far as the mutations at the Earth's Surface to be afterward explain'd would permit and allow in the case.*

Coroll. 3.

Coroll. 3. Since we have before shew'd, that the Mountainous Columns of the Earth are the loosest, the least compacted, and least solid of all others, The Earth would be the most subject to the Fissures and Breaches in those parts, and the generality of Springs and Rivers would now proceed from thence: Unless the peculiar Stony, or other firm Compages of the same prevented the Effects here mention'd, as sometimes perhaps might happen in the present case.

Coroll. 4. Hence 'tis evident, that there was no great Ocean, but only smaller Lakes and Seas, before the Flood. For otherwise the Tide or Flux of the Ocean would have been so great and violent, as to have superseded almost all the designs of the ensuing Deluge, and have withal extremely endanger'd, if not certainly destroy'd, the Ark, and all those Creatures which were entering into it: Which the small Tides in the small Lakes and Seas would not at all affect, or disturb.

XLIX. All these Fountains of the great Deep were broken up on the very first day of the Deluge, or the very first day when the Rains began.

XLIX. This is very easily understood from the space of time that the Comet was near the Earth. For the duration of this Disruption, or breaking of the Orb of Earth, occasion'd by the nearness of the Comet, must be commensurate thereto; which, tho' we should take in all the space it was nearer than the Moon, could not possibly, as is easie to Calculate, amount to Nine Hours; which is indeed much more than need be allow'd; and is yet sufficiently within that Days space which this Phenomenon, if occasion were, could allow us to suppose; and so fully satisfies the same.

L. Yet the very same day, *Noah*, his Family, and all the Animals entred into the *Ark*.

L. Tho' 'tis otherwise not a little strange that the entry into the *Ark* should be defer'd till this Day ; yet 'tis clear and easie on the present *Hypothesis*. For as to the Fountains of the great Deep, which were broken up this Day, thereby the Earth and its Contents were only gradually and insensibly elevated ; but no other disturbance given to *Noah* in his Entry into the *Ark* at the same time. The *Fissures* indeed were now made, but till the weight of the Waters from the Comet could operate, no Water would from thence arise to disturb him. And tho' they had, yet unless there were some of the great *Fissures* or Spouts just where he was, no interruption could this day be given him therefrom. As to the Rains themselves, tho' they all fell first upon the Earth nearly within the compass of this Day, and so must cause a most prodigious destruction and confusion upon the Earth where they so fell ; yet the peculiar situation of Mount *Caucasus*, on or near which the *Ark* was, did secure it ; this day, tho' so outrageous and destructive a one to the Inhabitants of the other parts of the Globe, was yet here fair and calm, as at other times : Which is thus demonstrated. 'Tis evident that Mount *Caucasus* is situate pretty near the Center of our Northern Continent ; or indeed some 20 or 25 degrees *Northeast* from the same ; that is, as will hereafter appear, pretty near the Point *b*, or somewhat below it towards *c* : Which Mountain *Caucasus* was directly expos'd therefore to the Comet at its nearest distance, represented in the Figure. When the Comet therefore was moving

Solut 65.
infra
Fig. 7.

moving from E to F, so soon as the Earth came within its *Atmosphere* and *Tail*, a *Cylindrical Column* of Vapours would be intercepted, and bore off by the Earth in its passage, whose Basis were somewhat larger than a great Circle on the Earth, and whose Direction or *Axis*, from the compound Motion of the Comet and of the Earth, were at about 45 degrees of Inclination with the Ecliptick or parallel to cd, the lesser *Axis* of the Earth. That is, the first fall of the Vapours would affect one *Hemisphere* of the Earth at a time, that, namely, which were properly expos'd to their descent; and the other would be not at all affected therewith, till the Earth's *Diurnal Rotation* by degrees expos'd the other parts in like manner, and brought every one at last within the verge of that *Hemisphere* on which was the first and most violent descent of the Vapours. Now this *Hemisphere* would be represented in the Figure by a d b; and the opposite one, which intirely escap'd at the same time by a c b. So that seeing the Ark, or Mount *Caucasus*, was below the Point b; and by the *Diurnal Rotation* quickly got farther within the fair *Hemisphere*; it would remain in the same during all the time of this first violent Fall of the Waters, and have a calm and quiet day for the entry into the Ark; while the other Regions of the Globe were subject to so violent a Storm; and such fury of descending Vapours as no Age past or future had been, or were to be expos'd to. This place could only be capable of some falling Vapours three or four hours after Sun-set, in case the Earth were not at that time got clear of the Tail of the Comet, in which it had been all the preceding day: And consequently, *Noah* had as fair and calm a time of entering into the

Ark, with all his Family, and the other Animals, as could be desir'd ; when no other parts of the Globe, but those agreeing in such a peculiar situation with him, could have permitted the same. Which is, I think, not a meer Satisfactory, but a very Surprizing account of the present Proposition.

Corollary 1. Hence the time of the breaking open of the Fountains of the Deep, and of the beginning of the Rains, very nearly coincident therewith, is determin'd ; and that, agreeably to the Mosaick History, much nearer than to a Day ; (with which exactness we have hitherto contented our selves in the case) And indeed almost to an Hour. For seeing all the Fountains of the great Deep were broken up on this day ; seeing the forty days Rain began on the same day ; seeing Noah, with all his Family, and all the other Creatures entred on this self-same day into the Ark ; all which certainly require very near an intire day ; and yet seem very incompatible ; there is no other way but to assert, that tho' the breaking up of the Fountains of the Great Deep, and the Fall of the Waters, were coincident, and upon the same day with the Entry into the Ark, as the Text most expressly asserts ; yet the place where the Ark was, escap'd the effects of the same till the Evening ; and while the rest of the Earth was abiding the fury of the same, enjoy'd so calm, fair, and undisturb'd a day, as permitted their regular and orderly going into the Ark before the Waters overtook them. So that the Deluge must, according to the Sacred History, have commenc'd in the Morning, and yet not reach'd the particular place where Noah was till the Evening, or the coming on of the ensuing Night ; Which how exactly the present Hypothesis is correspondent to, I shall leave the Reader to judge from what has been said under this last Proposition ; according to which 'tis plain, that

that the Comet pass'd by the Earth, broke up the Fountains of the Deep, and began the forty days Rains after Sun-rising, about Eight or Nine a Clock in the Morning; from which time till Eight or Nine a Clock at Night, and long after Sun-set, tho' the Waters fell with the greatest violence on the Earth, yet they affected a single Hemisphere at a time only, into which the Diurnal Rotation did not all that while convert the Regions near the Ark; and this most nicely and wonderfully corresponds to the greatest accuracy of the present case, and of the Mosaick History. So that now we may, agreeably both to the Sacred History, and the Calculations from the present Hypothesis, assert, that the Deluge began at the Meridian of Mount Caucasus on Thursday the twenty seventh day of November, in the year of the Julian Period, 2365, between Eight and Nine a Clock in the Morning. Which exactness of Solution, wherein not only the Day, but almost Hour assign'd from the Mosaick History is correspondent to the present Hypothesis, how remarkable an Attestation it is to the same, and how full a confirmation of the most accurate Verity of the Mosaick History, I need not remark: Such reflections when Just, being very Natural with every careful Reader.

Corollary 2. Here is an instance of the peculiar Providence of God in the Preservation of the Ark, by ordering the Situation so as to escape the Violence of the thick Vapours in their first precipitate fall, which otherwise must probably have dash'd it to pieces. For considering their Velocity of Motion, which indeed was incredible, no less than eight hundred Miles in the space of a Minute; 'tis not easy to suppose, that any Building could sustain and preserve it self under the violence thereof; which we see the Ark, by the peculiar place of its Situation, twenty or twenty five degrees North-East from the Center of our Northern Continent,

ment, was wonderfully secured from, while the other Regions of the Earth were expos'd thereto, and in great measure, 'tis probable, destroy'd thereby.

Coroll. 3. Hence 'tis evident, That the place of the Ark before assign'd, at Mount Caucasus, was its true one, and not any Mountain in or near Armenia. For had it been there seated, it had been expos'd to the violence of the falling Vapours, and instead of a quiet entry into the Ark on this first day of the Deluge, the Ark it self, with all the Creatures that were to be preserv'd in it, would have utterly perish'd in the very beginning thereof.

Coroll. 4. Hence the reason may easily be given, why the History of the Deluge takes no notice of this passing by of the Comet; viz. because none of those who surviv'd the Deluge, could see or perceive the same. For at the time of the approach of the Comet at first, both the latter end of the Night-season, when all were asleep; and the Mists, which according to the Nature of the Antediluvian Air, were probably then upon the Earth, and obscur'd the Face of the Heavens, hindred any prospect of this dreadful Body. And soon after the Morning came, they were actually involv'd in the Atmosphere of the Comet, and so in its Tail presently after, which would only appear a strange and unusual Mist or Cloud at a distance, wholly depriving them of the distinct view of the Comet it self, and leaving them utterly ignorant of the true occasion of the following Catastrophe, unless any intimation should have been given them thereof by a Divine Revelation.

- LI. Tho' the first and most violent Rains continued without intermission but forty Days, yet after some time the Rains began again, and ceased not till the seventeenth Day of the seventh Month, or a hundred and fifty Days after the Deluge began.

LI. It

LI. It has been already observ'd, That the Comet would involve the Earth in its *Tail* a second time, about fifty four or fifty five Days after its first passing by, as well as it did before; as 'tis also represented in the Figure. Which being suppos'd, the Earth must receive a new stock of Vapours as before; and the Rains which had intermitted for fourteen or fifteen Days, must begin again. The differences between the former and latter Rains would be, (1.) These latter Vapours proceeding from the *Tail*, whereas the former did principally from the much denser *Atmosphere* of the Comet, would be less copious, and less violent than the other, and cause a gentler Rain. (2.) These Vapours being newly rarified by the prodigious Heat at the *Perihelion*, and rais'd thereby to a mighty height in the *Tail*, from their greater rarity and lightness, higher ascent in our Air consequent thereupon, and longer time thence necessary to their cooling and descent in Rains upon the Earth, would be much longer in falling, and produce a continual Rain of many more days than the former did. Both which are exactly agreeable to the *Mosaick* History; whence it appears, that the first Rains had the principal stroke in the Deluge; and that if this secondary Rain commenc'd at the time here assign'd, it must have continued 95 or 96 days; which is considerably more than double the number of those 40, within which the former Rains were confin'd.

Cecroll. 1.
Schol.
post Hypo-
peth. 10.
prius.
Fig. 1.

LII. This second, and less remarkable Rain was deriv'd from such a cause as the former was.

LII. This is sufficiently evident already, since the same Comet afforded the matter for both Rains equally.

LIII.

LIII. Tho' the Fountains of the great Deep were broken up, and the forty days Rain began at the same time; yet is there a very observable mention of a threefold growth, or distinct augmentation of the Waters, as if it were on three several accounts, and at three several times.

LIII. This is particularly correspondent to the present *Hypothesis*; wherein (1.) The principal Rain of 40 days; (2.) The Eruption and Ascent of the Subterraneous Waters, occasion'd by their weight and pressure; (3.) The lesser Rain of 95 or 96 days, were both different in themselves, and in their time of commencing, and caus'd a distinct augmentation of the Waters, agreeably to the greatest nicety of this Proposition.

LIV. The Waters of the Deluge increas'd by degrees till their utmost height; and then decreas'd by degrees till they were clearly gone off the Face of the Earth.

LIV. This is evident as to the increase of the Deluge, by what has been already said; and will equally be so of its decrease, when we come to it hereafter.

LV. The Waters of the Deluge were Still, Calm, free from Commotions, Storms, Winds, and Tempests, of all sorts, during the whole time in which the Ark was afloat upon them.

Phænomen.
39. p. 115.

IV. It has already appear'd, that there were no Storms, Tempests, or other violent Commotions in the *Antediluvian* Air till the Deluge; and that during the space here referr'd to, none would arise, 'tis but reasonable to allow. For as to the first and principal Rain, it was so constant, so downright, and so uninterrupted, that no little commotion in the Air could have place; or if it had

had, could disturb it; which is commonly the case of long and settled Rains with us at this day. As to the Subterraneous Waters, ascending with some violence, they were confin'd to several particular places, and not universal; and though they might cause some commotions at the bottom of the Waters, yet might the surface of the same, and the Air, be sufficiently calm and undisturb'd. But as to the third Cause of the Deluge, It must be granted, agreeably to what has been before observ'd, That the descending Vapours would not be merely such, but mix'd with many heterogeneous Particles of all sorts, Sulphur, Brimstone, Niter, Coal, Mineral *Effluvia*, Metallick Steams, and the like, which the prodigious heat at the *Perihelion* had dissolv'd and elevated into the Tail of the Comet: From the confused mixture, irregular fermentations, and disagreeing motions of all which, 'tis probable the preternatural and violent commotions in the *Atmosphere* then, and since, are mainly to be deduc'd. So that alsoon as the latter 94 or 95 days Rains were almost over; alsoon as these rarified Corpuscles were descended into the lower and narrower Regions of the Air; and being crouded closer, were, by the greater heat there predominant, put into such irregular fermentations as they were already disposed for; 'Tis natural to suppose that Winds, and Storms of all sorts, and those in a very extraordinary manner, would arise, and cause the most sensible and extream perturbations of the Waters (now covering to a vast depth the face of the whole Earth) that could easily be conceiv'd: Of which the following Proposition will give farther occasion to discourse.

Coroll. 3.
Lem. 65.
prius.

LVI. Yet during the Deluge there were both Winds and Storms of all sorts in a very violent manner.

LVI. Seeing

LVI. Seeing, as we just now saw, that at the end of the latter Rains the greatest Storms possible were to be expected; and seeing yet the *Ark*, which had been afloat so long, and was so still (the Waters being now at the very highest) was incapable of abiding a stormy Sea, as we prov'd under the former *Phænomenon*; there at first view appears the greatest danger imaginable, of its perishing in the future immoderate and extraordinary Commotions. And this danger is increased by this Reflection; That as probably it had been afloat during the most part of the 150 days, while the Waters were gradually and gently augmenting; so one would imagine ought it to be, for at least as many days, during the at least as gentle and gradual decrease of the same afterwards: *i. e.* The *Ark* ought to have been as long afloat in the stormy, as it had been in the calm part of the Deluge. But this difficulty, which is to appearance so entirely insoluble, will soon vanish, if we consider that the *Ark* rested upon *Caucasus*, the then highest Mountain in the world. For seeing the Waters prevailed above the same Mountain 15 Cubits only, a great part of which depth of Water would be drawn by the *Ark* it self; upon the very first ceasing of the Rains from above, and of the Waters from the *Abyss* beneath, which permitted the least subsiding and diminution of the Deluge, the *Ark* must immediately rest upon the ground, and thereby secure it self from the impending Storms. And that accordingly it did so, at the time assign'd, on the conclusion of the 150 days, or the very same individual day when the Wind began, is particularly and expressly observ'd and affirm'd by *Moses*: Which being a very remarkable coincidence, exactly agreeable to the present *Hypothesis*,

as

Vid. Solu.
59. infra.

Gen. vii.
20.

as well as to the Sacred History, and of very considerable Importance, I shall set down the words at large, as follows:

The waters prevailed upon the Earth an hundred and fifty days (viz. from the seventeenth of the second, to the seventeenth of the seventh Month). And God remembered Noah, and every living thing, and all the Cattel that was with him in the Ark: And God made a wind to pass over the earth, and the waters asswaged. The fountains also of the deep, and the windows of heaven were stopped, and the rain from heaven was restrained. And the waters returned from off the earth continually: and after the end of the hundred and fifty days, the waters were abated. And the ark rested in the seventh month, on the seventeenth day of the month, upon the mountains of Ararat.

Gen. vii.
ult. & viii.
1, 2, 3, 4

Corollary. Hence 'tis obvious to remark the wonderful Providence of God for the Preservation of the Ark, and the sole Remains of the old World therein contain'd, in ordering all circumstances, so, that it was afloat just all the calm Season of the Deluge, but as soon as ever any tempestuous Weather arose, was safely landed on the top of Caucasus.

LVII. This Deluge of Waters was universal in its extent and effect; reaching to all the parts of the Earth, and destroying all the Land-Animals on the intire Surface thereof; those only excepted which were with Noah in the Ark.

* LVII. This might justly have been made a Corollary of the next Proposition, (for if the Waters in any one Region, much more a compleat Hemisphere, exceeded the tops of the highest Mountains, it would certainly diffuse it self and overflow the other also): But being capable in the present Hypothesis of a separate Proof, deserves

serves a distinct Consideration. Now of the several Causes of the Deluge, those Vapours which were deriv'd from the Comet's Tail, both at the first and second passage of the Earth through the entire Column thereof, by reason of the Earth's *Mora*, or abiding therein about 12 hours, or a semi-revolution, and the fall of the Vapours on an entire Hemisphere at the same time, would affect the whole Earth, and though not exactly equally, yet pretty universally make a Deluge in all the Regions of the Globe. The subterraneous Waters, being the proper effect of the weight of the other, would also be as universal as they, and that every where, generally speaking, in the same proportion. 'Tis true, the Waters which were derived from the Atmosphere of the Comet (the principal Source of the 40 days Rain) were not wholly so universal as the former *at first*, by reason of the shorter *Mora* or abiding of the Earth therein (though even much above half of the Earth's entire surface would hence be immediately affected): But if we consider the Velocity of the Earth's *Diurnal Rotation*, and that the Mass of newly acquir'd Vapours was not at first partaker of the same, but by degrees to receive the impression thereof, we shall with ease apprehend, that a few of the first Rotations would wind or wrap these, as well as the other Vapours, quite round the Earth, and thereby cause a very equal distribution of them all in the *Atmosphere*, and at last render the Rains very evenly Universal. To which uniform distribution the Nature of the Air it self, as at present it I suppose does, might contribute: Such an *Elastical Fluid* as the Air scarce suffering a lasting Density or Croud of Vapours in one Region, without communicating some part

part to the others adjoining ; that so a kind of *Equilibrium* in the weight, crassitude, and density of its several Columns may be preserv'd through the whole. So that at last, the Deluge must have been Universal, because every one of the Causes thereof appear to have been truly so.

LVIII. The Waters at their utmost height were fifteen Cubits above the highest Mountains, or three Miles at the least perpendicular above the common Surface of the Plains and Seas.

LVIII. In order to make some estimate of the quantity of Water which this *Hypothesis* affords us, let us suppose that the one half came from the Comet, or the Rains ; and the other half from the Subterraneous Water : (Tho' 'tis not impossible that much the greater part might arise from the latter :) Let us also suppose, that the tenth part of the rest arose from the Tail of the Comet, at both the times of its enclosing the Earth ; and the other nine from its *Atmosphere* ; (tho' 'tis possible that a much less proportion ought to be deriv'd from the former) 'Tis evident from the Velocity of Comets, at the distance from the Sun here to be consider'd, and the usual Crassitude or Diameter of the Tails thereof, that the Earth would be near half a day, or 12 hours each time within the limits thereof ; and by consequence that it would intercept and receive upon it self a *Cylindrical* Column of Vapour, whose *Basis* were equal to that of a great Circle on the Earth, and whose *Altitude* were about 750000 Miles. If we therefore did but know the proper density of the Vapour composing the Tail of the Comet, or what proportion it bears to that of Water, 'twere easie to reduce this matter to Calculation, and very nearly to

E e

determine

determine the quantity enquired after. That the Tail of a Comet, especially at any considerable distance from the Comet it self, is exceeding rare, is evident, by the vastness of its extent, and the distinct appearance of the fixt Stars quite through the immense Crassitude of its entire Column. Let us, for computation's sake, suppose that the Density of Water to that of this Expanded Column of Vapour is as 3400000 to one; or, which is all one, (since Water is to our Air in Density as 850 to one) that the Density of our Air, is to the Density of this Column of Vapour, as 4000 to one, (which degree of rareness if it be not enough at a great distance from the Comet, as at the second passage; yet I suppose may be more than sufficient at the very Region adjoining thereto, as at the first passage; and so upon the whole no unreasonable *Hypothesis*;) So that if we divide the Altitude of this *Cylindrical* Column of (750000 Miles, or) 3750000000 Feet by 3400000 (37500 by 34) we shall have a Column of Water equal thereto. By which Calculation the quantity of Water acquir'd at each time of the passage through the Tail, would equal a *Cylinder*, whose *Base* were a great Circle on the Earth, as above; and whose *Altitude* were 1103 Feet: Which quantity being twice acquir'd, must be doubled; and then will amount to a *Cylinder* whose *Base* were the same as above, and whose *Altitude* were double the others, or 2206 Feet. Now *Archimedes* has demonstrated, that the intire Superficies of a Sphere or Globe is four times as large as the *Area* of one of its great Circles. And by consequence the Column of Vapour before-mention'd, when converted into Rain Water, and spread upon the Face of the Earth, would cover the Globe intirely

ly round (had there been no Dry land or Mountains extant above the Surface of the Plains and Seas) a quarter of the height last assign'd, or $541\frac{1}{2}$ Feet every way: Which being suppos'd, and what was at the first *Postulated* of the *Atmosphere's* *quota*, the whole Water afforded by the Comet will cover the Earth intirely to the perpendicular height of the $5410\frac{1}{2}$ Feet. To which add, by the Original *Postulatum*, the equal quantity ascending from the Bowels of the Earth, the Total amounts to 10821 Feet; or above two Miles perpendicular Altitude: Which, when allowance is made for those large spaces taken up by the extant Dry Land and Mountains, will approach very near that three Miles perpendicular height requir'd by the present *Phænomenon*.

Corollary. If the several particulars requisite to the nice adjustment of these Computations were more exactly enquir'd into, some light on the present Hypothesis, might be afforded to the Density of the Atmospheres and Tails of Comets, which is hitherto undetermin'd; the consideration of which matter must be refer'd to Astronomers.

LIX. Whatever be the height of the Mountain *Caucasus*, whereon the *Ark* rested, *now*; it was at that time the highest in the whole World.

LIX. If we consult the Figure here refer'd to, Fig. 71 we shall easily apprehend the Reason of this, otherwise, strange *Phænomenon*. For seeing this Mountain was the highest in *Asia*, or the middle Regions of our Continent; and seeing withal that intire Continent, and chiefly the middle Regions thereof, were elevated by the greatest protuberance of the *Abyss* d b c above any other correspondent parts of the whole Globe, the absolute or intire height of this Mountain arises

E c z

not

not only from its proper Altitude above the neighbouring Plains, but also from the Elevation of the whole Continent, or peculiarly of its middle Regions above the Ancient Surface of the Seas; so that by this advantage of situation, it was at the time here concern'd higher not only than its Neighbours, which its own Elevation was sufficient for, but than any other on the Face of the whole Earth: Some of which otherwise it could, I believe, by no means have pretended to match, much less to out-do in Altitude. Now altho' the presence of the Comet which produc'd these Tides in the *Abyss*, and elevated the intire Continents above their ancient level, did not remain after the Disruption of the Fountains of the Deep on the first day of the Deluge; yet the Effect thereof, the Elevation of the Continents above their ancient Level, would not so soon, nay would scarce ever intirely cease. We know by common observation, that if a Solid or Setled Mass of Bodies be torn or pull'd in pieces, 'tis not easie to put every thing into its place, and reduce the whole to the same fixed Position, and within the same fixed limits, it had before. If a solid compacted mound of Earth were once shatter'd and divided, were levell'd and remov'd, tho' afterward every individual Dust of the former Earth were laid together again upon the very same Plot and Compass, yet would it not be immediately confin'd within its ancient dimensions; its height would be at first considerably greater than before; and tho' that in length of time would be by degrees diminish'd, by the gradual settling and crouding together of the parts, and so some approaches would be made thereby towards its ancient density, and lesser elevation; yet neither would be intirely attain'd; in any
mo-

moderate space of time at least. And this is the very case before us. That Oval Figure which the Orb of Earth was stretch'd to at the Deluge, would remain for a considerable time, and be many years in settling so close together, that it might afterward remain fixt and firm for the following generations; before which time 'tis evident, that the Regions near the Center of our Northern or Larger Continent, were the highest, and those at 90 degrees distance every where the lowest; and by consequence at the time of the *Arks* resting, the Mountain *Caucasus*, near the Center of the Northern Continent, was elevated above the rest, and particularly above the *Pike of Teneriff*, which seems to be at present the highest of all others. And thus that terrible *Phænomenon* is solv'd, which the Reverend Mr. Warren was so puzzled with, that even on the allowance of so much Miracle as the creation of the Waters of the Deluge, and *Annihilation* of the same afterward, yet could he not account for the Letter of *Moses* without a forc'd and ungrounded Supposition, to the same purpose with the Proposition before us: As you will find him, and not without reason, very emphatically expressing himself on this occasion.

Corollary 1. Here is a visible instance of the Divine Providence for the preservation of the Remains of the Old World, by ordering the building of the Ark near that which would be the highest Mountain in the World; that soun the very first ceasing of the Rains, and the beginning of the Winds and Storms, it might immediately be safe on the top thereof.

Coroll. 2. The same careful and wise providence is conspicuous in the so accurately adjusting all the circumstances of the Deluge; that tho' it should be high enough to destroy the whole stock of the Dry-land

Animals; and yet but just so much above the Mountain Caucasus, as permitted the Ark to rest at the very first decrease of the Waters, and the commencing perturbations of the Air, and the Waves necessarily ensuing; which otherwise must still have destroy'd it, notwithstanding the advantage of its situation before observ'd.

Coroll. 3. *Supposing the Truth of our first Postulatum, of the Verity of the Letter of the Mosaick History; as certain as is the greater bright of the Pike of Teneriff, or of any other Mountain in the World, above that of Caucasus Now; (of which I suppose no body makes any question) so certain is it (bating unknown causes, and a miraculous Power, as is always in such cases to be suppos'd) that a Comet was the cause of the Mosaick Deluge. For 'tis certain, by the plainest deduction from the express words of Scripture, that the Mountain on which the Ark rested was at that time the highest in the World. 'Tis therefore certain, that the Continent or Basis on which Mount Caucasus stands, was elevated higher at the Deluge than 'tis at present: and 'tis also certain, that no Body or Mass of Bodies in the whole World can elevate or depress a Continent of the Earth, but such as are capable of approaching the same; or in other words, but Comets; and consequently a Comet did approach near the Earth at the time assigned, and was the cause of the Deluge. Which Chain or Connexion I take to be so strong, that I believe 'twill not be possible to evade its force; and so what on other arguments has been already establish'd, is fully confirm'd by this.*

Coroll. 4. *'Tis equally demonstrable, that the Upper Orb or Habitable Earth is founded on a Subterraneous Fluid, denser and heavier than it self: This circumstance being absolutely necessary to account for the Phenomenon we are now upon. For if the internal Regions of the Globe were firm and solid (as is commonly*
suppos'd;

suppos'd; tho' wholly gratis, and without ground:) Tho' the Comet had pass'd by, yet there could have been no elevation of any Continent, and the Proposition before us must still have remain'd Insoluble.

LX. As the Fountains of the great Deep were broken up at the very same time that the first Rains began, so were they stopp'd the very same time that the last Rains ended; on the seventeenth day of the seventh Month.

LX. Tho' I cannot say that the Account of the Deluge, now given, can determine to a Day the time of the Subterraneous Waters ceasing to spout forth (this *stoppage of the Fountains of the Deep in Moses*) yet 'tis evident, that the time defin'd by the History is very agreeable to that which from the consideration of the thing it self one should naturally pitch upon. For since the Ascent of the Subterraneous Waters depended on the Waters produc'd by the Rains, as on the beginning of those Rains it began to ascend, on the continuance thereof continued to do the like, so at the ceasing, probably enough might it cease also; as this Proposition assures us it really did.

LXI. The abatement and decrease of the Waters of the Deluge was first by a Wind which dried up some. And secondly, by their descent through those Fissures, Chaps, and Breaches, at which part of them had before ascended into the Bowels of the Earth, which received the rest. To which latter also the Wind, by hurrying the Waters up and down, and so promoting their lighting into the before-mention'd Fissures, was very much subservient.

LXI. In order to the giving a satisfactory account of this Proposition, and of the draining the Waters of the Deluge off the Surface of the Earth (which to some has seem'd almost as difficult to solve as their first Introduction); It must first be

Lem. 78.
cum Co-
roll. & So-
lur. 6.
prius.

granted that the Air could receive and sustain but very inconsiderable quantities, in comparison of the intire Mass which lay upon the Earth; yet some it might, and would naturally do; which accordingly both the *Wind* here mentioned, and the *Sun* also took away, and turn'd into Vapour immediately after the ceasing of the latter Rains. But as to all the rest, there is no imaginable place for their Reception, or whither their natural Gravity oblig'd them to retreat to, excepting the Bowels of the Earth; which must therefore be distinctly consider'd in this place. Now we may remember, from what has been formerly said, that the quantity of Solids, or earthy Parts in the upper Orbs primary Formation, was very much greater than that of Fluids, or watery Parts; and consequently, that the inward Regions of the Earth being generally dry and porous, were capable of receiving mighty quantities of Waters without any swelling, without any alteration of the external Figure, or visible Bulk. And indeed, if we allow, as we ought, any considerable Crassitude to this upper Orb, its interior Regions might easily contain a much greater quantity of Waters than what was upon the Earth at the Deluge; especially when so great a part of them was before there, and would only fill up their old places again. So that all the difficulty is now reduc'd to this, By what Pipes, Canals, or Passages, these Waters could be convey'd into the Bowels of the Earth? Which in truth can admit of no dispute, nothing sure being to be conceiv'd more natural *Inlets* to these Waters, than those very *perpendicular Fissures* which were the *Outlets* to so great a part of them before. As soon therefore as the Waters ceas'd to ascend upwards through those Breaches, they must to be sure descend downwards

wards by the same; and this descent is more natural than the *prior* ascent could be esteem'd to be; which was a force upon them, compelling them against their Natures to arise upwards, when this retreat into the same Interstices is no other than their own proper Gravity requir'd, and inclin'd them to. The case here is in part like that of a *Sive*, first by force press'd down into a Vessel of Water, till it were fill'd therewith, and then suffer'd to emerge again; where through the very same Holes at which the Waters ascend-ed into, they afterward descended out of the *Sive* again, and retreated into their own Element as before. All that in particular deserves here to be farther noted, is, the Interest of the Wind, or of the Agitations of the Waters (*goings and returnings* in the *Hebrew* Phrase) made mention of in this Proposition. And these Commotions are in truth very useful, and very necessary assistants to the draining of the Waters from off the Earth. For when the most part of the Fissures were in the Mountains, 'twould have been a difficult thing to clear the Vallies and lower Grounds, had there been a perfect Calm, and every Collection of Waters remain'd quietly in its own place. But when the Waters were so violently agitated and hurried from one place to another, they would thereby very frequently light into the *Fissures*, and Breaches, and so descend as well as the rest into the heart of the Earth; very agreeable to the Assertion of this Proposition.

Corollary 1. *Seeing the most of the Fissures were in the Mountains, the decrease and going off of the Waters would be greatest at first, while the generality of the Mountains were under water, and less and gentler afterwards.*

Coroll.

Coroll. 2. *Several low Countries now bordering on the Seas, might for many Years after the Deluge be under Water, which by the descent of more of the Waters into the Bowels of the Earth, might become Dry-land afterward; and by their smoothness and equability shew their once having lain under, and been made so plain by the Waters. Instances of which are now very observable in the World: In particular, those parts of Cambridgeshire and Lincolnshire which border on the German Ocean, appear very evidently to have originally been in the same case, as any careful Observer will easily pronounce.*

LXII. The dry Land, or habitable Part of the Globe, is since the Deluge divided into two vast Continents, almost opposite to one another, and separated by a great Ocean interpos'd between them.

LXII. The Figure in which the Comet left the Earth, and which it would in some measure retain ever after, was, as may be seen in the Figure, an Oval or Oblong Spheroid, whose longer Axis *a b* would determine the highest extant Parts of the Earth; and whose shorter Axis *c d*, by a Revolution about the Center perpendicularly to the longer Axis, would alike determine the lowest or most depress'd Parts thereof. When therefore as many Waters were run down into the Earth as the Apertures could receive; all that remain'd (excepting the ancient lesser Seas somewhat augmented every where) must be found in the lowest Vallies, or near the shorter Axis's Revolution, all round the Globe, composing a mighty Ocean; while the two elevated Regions, near the two ends of the longer Axis, were extant above the Waters, and compos'd those two opposite Continents of the Earth, made mention of in this Proposition.

Corollary

Corollary 1. 'Tis probable that America is intirely separated from our Continent by the interpos'd Ocean, without any Neck of Land, by which it has been by many imagin'd to communicate with Tartary.

Coroll. 2. America was peopled from this Continent some Ages after the Deluge by Navigation. For seeing there is no Communication between us and them by Land; seeing also the Ancient Inhabitants of it perish'd intirely at the Deluge (as the Testimony of the Sacred Scriptures, the consideration of their lesser Numbers, and the impossibility of any Preservation of Men by an Ark any where but at the Mountain Caucasus, the highest Hill near the Center of the highest Continent in the World, appearing from what has been said, do conspire to demonstrate). 'Tis evident they must have been re-peopled by Sea, from this Continent.

Coroll. 3. Navigation, tho' it was not before the Flood, or till then very inconsiderable; yet is not so wholly new and late in the World, as some imagine. Which Observation is very agreeable with the Sacred Records, which intimate no less than three Tears Voyages in the days of Solomon; and with Herodotus, who mentions a Voyage through the Red-Sea round Africa, and so through the Straights of Gibraltar into the Mediterranean in the days of Neco.

1 Kings
x. 22.
2 Chron.
ix. 21.
L. 4. c. 42.
43.

LXIII. One of these Continents is considerably larger than the other.

LXIII. Since in all Tides, and so in those Pro-tuberances which occasion'd the present Continents, that which respects the Body producing the same, is larger than its opposite one; 'tis evident, so it ought to be here, and the Continent situate about the Point b, considerably larger than the opposite one about a, agreeably to this Proposition.

Coroll.

Corollary. In this posture of the Abyss, and its incumbent Orb, the Earth is correspondent to the Egg, its ancient Symbol and Representative, not only in its inward and intire Constitution, but in some measure in its external Figure also; the resemblance between them becoming by this means in a manner Universal.

LXIV. The larger Continent lies most part on the North-side of the Equator; and the smaller, most part on the South.

LXIV. The Position of the Continents depended mainly on the time of the year when the Comet passed by. For since the Comet descended in the Plain of the *Ecliptick* from the Regions almost opposite to the *Sun*, and came to its nearest distance about 130 degrees onward from the Point in the *Ecliptick* opposite to the *Sun*, before which, and yet scarce till after the Comet were past 90 degrees, or the Periphery of the *Ecliptick*, would the Tides be great enough to burst the Orb of Earth, and fix the Centers of the Continents; By considering the place of the *Earth* in the *Ecliptick*, and counting about 100 degrees onward, one may determine the Latitude of the Point on the Earth directly expos'd to the Comet's Body, and by consequence of its opposite Point also; about which Points the two Continents lay. Now the Earth being about the middle of *Taurus* to an eye at the *Sun* (which I always in such cases suppose), at the time of the passing by of the Comet, about the middle of the second Month from the *Autumnal Equinox*, the latter part of *Leo* (being 100 degrees onward from the Point opposite to the *Sun*) will nearly determine the Latitude of the larger Continent *d b c*, as by consequence will the latter part of *Aquarius* that of the smaller *d a c*: On which accounts 'tis evident, that the larger must be mostly on the North, and the smaller mostly on the South-side of the Equator.

LXV. The

LXV. The Middle or Center of the *North Continent* is about sixteen or eighteen degrees of *Northern Latitude*; and that of the *South* about sixteen or eighteen degrees of *Southern Latitude*.

LXV. This Proposition (which more nicely determines that Position of the Continents which the last more generally asserted) is thus demonstrated. Each Continent must retain that Position which it had when its Compages was burst by the Elevation of the *Abyss*. Now the bursting of the Orb is to be suppos'd before the Comets nearest distance; and by consequence the Centers of the two Continents a and b ought to have the Latitude of the Points about 90, or rather nearer an 100 degrees onward beyond that opposite to the *Sun*, or beyond the *Sun* it self. So that the Center of the *Northern Continent*, near the *South-East* point of *Arabia*, and of the *Southern*, near the Source of the vast River *De la Plata*, ought to be about the same Latitude with the 20th degree of *Leo*, and of *Aquarius*, or near 16 degrees, the former of *Northern*, the latter of *Southern Latitude*, as this Proposition asserts them really to be.

Corollary 1. If therefore we were to determine the time of the Year of the Comet's passing by the Earth, or the commencing of the Deluge, from the Position of the Centers of our two opposite Continents, which depend thereon, we ought to assign it near the middle of the second Month, from the Autumnal Equinox, agreeably to the time already fixt both from the Sacred History, and the Calculations of Astronomy at the tenth Hypothesis foregoing.

Coroll. 2. Hence all those Corollaries to the third and fourth Argument of the said tenth Hypothesis are mightily confirm'd: To which I refer the Reader for their second perusal; the importance of their Subject well-deserving the same at his hands.

Coroll.

Theor. 1.
2. c. 9.

Coroll. 3. Hence perhaps we may derive the occasion of that ancient, current, and much insisted-on Tradition concerning the high or elevated situation of Paradise; which is so very much attested to by Antiquity, and yet so very strange and obscure in it self. For since Paradise, as has been already prov'd, was very near that point where the Center of our Continent is, the East or Southeast Border of Arabia: And since withal, as we have shewn, the same Regions were by the Comet at the Deluge elevated more than any others on the intire Globe; and since, lastly, it would for a long time retain in good measure such its most rais'd situation, and continue higher than any other correspondent parts of the Earth; this appears a rational Occasion or Foundation of that celebrated Tradition here refer'd to: Which otherwise how to give any tolerable account of, upon any solid Principles, I confess I am, and have always been wholly to seek.

LXVI. The distance between the Continents, measuring from the larger or Northern South-Eastward, is greater than that the contrary way, or South-Westward.

LXVI. Seeing the Motion of the Comet about its nearest Position was much more considerable than the Diurnal one of the Earth; and seeing withal the greater and higher protuberance would arrive at a sufficient force to burst its incumbent Orb or Continent somewhat sooner than the lesser and lower; it will follow that the Point b would not be just opposite to the Point a, but nearer the place q in the Figure. By which means the distance from q by c to a would be greater than from the same q by d to a; or from the Center of the greater Continent to that of the lesser South-eastward, than South-westward: Exactly as this Proposition requires.

LXVII. Neither

LXVII. Neither of the *Continents* is terminated by a round or even circular Circumference: but mighty Creeks, Bays, and Seas running into them; and as mighty Peninsula's, Promontories, and Rocks jetting out from them, render the whole very unequal and irregular:

LXVII. If the Surface of the Earth before the Deluge had been even and smooth, without Mountains and Valleys; and their Consequents, Seas and Dry Land, the passing by of the Comet must indeed, as before, have certainly caus'd a distinction of the two Continents, and must have interpos'd an Ocean between them; but then these two circumstances would have obtain'd also, first, that all the Waters of the intire Globe would have left the Continents, and solely compos'd an Ocean; and secondly, That the Termination or Boundaries of the Ocean and the Continents would have been circular, round, and even on every side. But since the Surface of the Earth was uneven, irregular, and distinguish'd every where into Mountains, Plains and Valleys, into Seas and Dry Land, the present Terraqueous Globe, with those inequalities of the Termination of each Continent mention'd in this Proposition, is a most easie and natural, nay plainly necessary result of this great Mutation at the Deluge.

Coroll. 1. Hence 'tis farther evident, that the Surface of the Antediluvian Earth was not plain and even, but had those distinctions of Mountains and Valleys, Seas and Dry Land, which from other Arguments has been before establish'd.

Coroll. 2. Hence therefore it appears (what should have been before observ'd) that all the Earth might be Planted and Peopled before the Deluge, tho' Navigation were then either not at all, or not considerably known: There being no Ocean or separate Continents; and scarce any such thing as an Island, or Country but what with ease might be gone to by Land.

LXVIII.

LXVIII. The depth of that *Ocean* which separates these two *Continents*, is usually greatest farthest from, and least nearest to either of the same *Continents*; there being a gradual descent from the *Continents* to the middle of the *Ocean*, which is the deepest of all.

LXVIII. The reason of this gradual declivity towards the middle of the *Ocean*, is very plain from the Figure hereto belonging. For since the Earth's Surface became in some degree an Oval, or *oblong Sphaeroid*, 'tis necessary that there should be (as far as the other irregularities of the Globe would permit) a descent from the ends of the longer *Axis* b and a, to those of the shorter c and d in their intire circumvolution, which gives a most obvious account of the present *Phænomemon*.

LXIX. The greatest part of the *Islands* of the Globe are situate at small distances from the Edges of the great *Continents*; very few appearing near the middle of the *Main Ocean*.

LXIX. Since *Islands* are only such high Regions as would be extant above the Surface of the Waters, tho' they cover'd the Neighbouring parts; and since the *Ocean*, as we have now shewn, was deepest in the middle between the two *Continents*; 'tis plain that, *Cæteris paribus*, the higher Regions would more frequently be extant near the *Continents*, than about the middle of the said *Ocean*; as this Proposition asserts.

LXX. The Ages of Men decreas'd about one half presently after the Deluge; and in the succeeding eight hundred or nine hundred Years, were gradually reduced to that standard at which they have stood ever since.

LXX. The first part of this is already sufficiently accounted for in that Proposition, where the causes
of

of the change in the duration of Mens lives at the Flood were in general enquir'd into. But the reasons of the gradual Decay in the succeeding Ages are here to be assign'd. Now here 'tis not impossible that the considerably long lives of the first *Postdiluvian* Patriarchs might in part depend on the vigorous Constitution of their Fathers, not to be *immediately* impair'd to the utmost, or destroy'd in their Posterity, till by degrees, and in length of time it was effected. But besides, 'tis to be consider'd, which I take to be the principal thing, that seeing the corrupted *Atmosphere*, with the pernicious Steams arising from the newly acquir'd *Chaotick* Crust, or Sediment of the Waters, and their unhappy Effects on the Fruits, as well as living Creatures upon the Earth, must be allow'd the occasion and cause of the shortning of Humane Life; such Regions as were freest from, or most elevated above the said Sediment, or *Chaotick Atmosphere*, must have chiefly continued as they were before, and so the ancient Longevity would chiefly be preserv'd therein. Which being suppos'd, and what has been already advanc'd withal consider'd, this Proposition will be easy, plain, and natural; and a peculiar Attestation of the present *Hypothesis*. For seeing *Noah* and the *Ark* were landed on *Caucasus*, the most elevated Region of the Earth, and freest from the Sediment of the Waters, as well as the grossness of the *Chaotick Atmosphere* below, that place would scarce differ for a good while from the *Antediluvian* State of things, and the lives of Animals would retain very near their ancient Duration; which accordingly we find was really done. *Noah* survived the Deluge no less than 350 Years, and compleated 950 in the whole (somewhat beyond the moderate proportion of the *Antediluvians*

Gen xi. 2.

themselves, as the Table will easily shew). But then by reason both of the descent of his Posterity into the Plains, and lower Grounds, and principally by the gradual subsidence of those Regions themselves into the gross Atmosphere below, they became gradually liable to those Diseases, and that shortness of Life, which we before shew'd to have been the sad Effects thereof, and to which all Mankind has since been subject.

Grunt. p.
59, 85, 86.

Corollary 1. *Mankind increased vastly more soon after the Deluge than in these latter Ages of the World. For whereas a Country is 280 Years now in doubling its Inhabitants, had the same rate held ever since the Deluge, Mankind at this day would not have reach'd the number of two hundred thousand Souls; which yet is esteem'd to be between three and four hundred Millions, or near two thousand times as many as the said number, deducible from the present rate of the Increase of Mankind. So that 'tis evident, That the Antediluvian Fruitfulness, and numerous Stock of Inhabitants (which are also themselves hereby fully establish'd) must have prevail'd, servata proportion, among the Primitive Postdiluvians for some Centuries, or else no Account were to be given of the present numbers of Men upon the Face of the Earth; whereby the Verity of this Proposition, the Veracity of Moses therein, the great importance thereof, and the necessity of the present Solution, and of that Theory on which it is built, are mightily confirm'd.*

Job 41.
16.

Coroll. 2. *Hence we may nearly determine the Ages of Men for the first eight or nine hundred Years after the Deluge, from the length of their Lives given. Thus Job, who appears to have liv'd at the least between two and three hundred Years, must have been contemporary with some of the Patriarchs between*

between Heber and Abraham, to whom that Duration of Humane Life belong'd; and thus we may examine and determine the Ages of the most Ancient King's mention'd in Prophane Histories, from the like Duration of their Lives or Reigns, as the following Corollary will more particularly observe.

Coroll. 3. Neither the Egyptian Dynasties, nor the Assyrian Monarchy, could be coeval with the first seven or eight hundred Years after the Deluge, none of their Kings Reigns set down by Chronologers reaching that number of Years which the length of Humane Life at that time requir'd; nay, nor any other than Kings now may, and do arrive at in these latter Ages of the World.

Coroll. 4. The Antediluvian and Postdiluvian Years mention'd in Scripture were true Years of twelve, not fictitious ones of one Month apiece, as some, that they might reduce the Age of the first Patriarchs to the short term of Life since usually attain'd to, have been willing to surmise. This fancy is strangely absurd, and contrary to the Sacred History, and in particular irreconcilable with this Proposition. For had the ancient Years been Lunar, of one Month, and the latter Solar of a twelve, by which the same Duration of Humane Life had been differently measur'd; the numbers of Years which Men liv'd, must have alter'd in the Proportion of twelve to one of a sudden, at such a change in the Year referr'd to, and not gradually and gently, as 'tis here evident they did.

LXXI. Our upper Earth for a considerable depth, even as far as we commonly penetrate into it, is *Fossilious*, or newly acquir'd at the Deluge: The ancient one being covered by fresh *Sirata* or *Layers* of Earth at that time, and thereby spoil'd or destroy'd as to the use and advantage of Mankind.

LXXI. 'Tis not to be suppos'd, that the Waters of the Deluge were merely the pure Element of Water, sincere and unmix'd. What came from the Comet's *Atmosphere*, must partake of its earthly heterogeneous Mixtures; and what was squeez'd up from beneath, must carry up much Dirt and earthy Matter along with it. Besides which, as soon as the stormy Weather began, the soak'd and loosen'd Tops of Mountains would easily, by the Winds and Waves together, be wash'd off, or carried away into the Mass of Waters, and increase the impurity and earthy mixtures thereof. On all which accounts the Waters of the Deluge would be a very impure, thick, and muddy Fluid, and afford such a quantity of earthy Matter as would bear some considerable Proportion to that of the Water it self. Now this earthy Matter being heavier than the Water, would by degrees settle downwards, and compose first a mighty thick, dirty, muddy Fluid in the lower Regions of the Waters, and at last a plain earthy Sediment at the bottom of them; which would at once spoil and bury the old Surface of the Ground, and become a new Crust or Cover on the face thereof. Now, that we may see whether this Sediment or Crust could be so thick and considerable as this *Phænomenon* requires, let us suppose, as before, the perpendicular height of the Waters of the Deluge to have been three Miles above the common Surface of the Plains and Seas, and the thirtieth part only of the intire Fluid on the Face of the Earth to have been earthy Parts fit to compose the Sediment or Crust beforemention'd. Let us also remember what has been already observ'd from Mr. *Newton*, That Earth is at least three times as dense and heavy as Water;

Hypoth.
2. prius,

ter; so that the thirtieth part in quantity of Matter, would only take up the ninetieth part of the whole space, either in the Waters, or when 'twas settled down by it self, and became a new Crust or Orb upon the Earth. If we then divide 15000, the number of Feet in the whole height of the Waters, (not here to allow for the spaces possess'd by the extant Parts of the Earth) by 90, (1500 by 9) the quotient will shew the the Crassitude or Thickness of this Sediment or Crust covering the Face of the Earth, *viz.* 166½ Feet, one place taken with another indifferently. Which quantity fully accounts for the Proposition we are upon, and agrees with the Observations made in the Bowels of our present Earth to as great accuracy as one could desire or expect.

Corollary 1. Hence it appears, That the Earth was generally uninhabitable for several years after the Flood: This new factitious Sediment of the Waters requiring no little space of time ere it would be fully settled, its Strata consolidated, its Surface become hard and dry, and its Vegetables sprung out of it; before which time 'twere uninhabitable by Man, and the other Dry-land Animals.

Coroll. 2. Hence we may see the Care and Wisdom of Divine Providence for the Preservation and Maintenance of Noah, and of all the Creatures in the Ark, after their coming out of the same again; by ordering all things so, that the Ark should rest on the highest Mountain in the World, and that the Waters should so little surpass the same, that the Sediment thereof could neither spoil the Fruits of the Ground, nor render the Surface uninhabitable, as it did on the other Regions of the Earth. For since the quantity of the Sediment would generally be proportionable every where to the perpendicular height of the Waters over

the Surface of the Ground below; tho' it would cover all the other Regions of the whole Earth, yet on this highest of all Mountains, (cover'd but a few Days, or perhaps Hours, with any Waters, and they never above fifteen Cubits perpendicular height) the quantity of the Sediment would here be perfectly inconsiderable, and the Earth would not be at all alter'd from what it was before, nor its Vegetables hurt by this Universal Deluge. So that this, and this only was the Spot of Ground capable of receiving the Ark, and of sustaining the Creatures therein, till afterwards the rest of the Earth became fit for their Descent and Habitation. To this spot therefore, by such a wonderful adjustment of all the requisite Circumstances of the Deluge, preserv'd and distinguish'd from all the rest of the World, the Divine Providence did conduct the Ark; and on this was laid the Foundation of the present Race of Mankind, and of all those Terrestrial Animals, which are now on the Face of the whole Earth; which otherwise had perish'd at their Exit out of the Ark, notwithstanding their wonderful Preservation therein during the Rage of the Deluge.

Gen. viii.
11.

Coroll. 3. Hence we may easily understand whence the Olive-branch was brought by the Dove to Noah. For when the Trees adjoyning to the Ark, or on the neighbouring Tops of the Hills had suffer'd small damage by the Flood, and had since the clearing of the Waters enjoy'd almost the whole Spring, and half the Summer; they must be as flourishing, and full of as many new and tender Sprouts as ever; one of which might therefore be easily broken off by the Dove, and brought to Noah in her Mouth; which new, dry, and firm Sprout or Branch, being a clear evidence, that the Waters were not only gone, and the Ground dry a great while before, but that the Earth was still, as formerly, fit for the Production
of

of its wonted Trees and Fruits, must exceedingly tend to the Satisfaction of Noah, and the Confirmation of his Faith and Hope in an entire Deliverance, and in the future Renovation of the World.

LXXII. This *Falitious Crust* is universal, upon the Tops of the generality of the Mountains, as well as in the Plains and Vallies; and that in all the known Climates and Regions of the World.

LXXII. This is a necessary consequent from the Universality of the Deluge already accounted for. And tho' the generality of the Mountains would usully have a thinner Sediment or Crust than the Plains or Vallies, in proportion to the lesser height of the Waters over each of them respectively; yet they being at the Deluge much inferior to the height of *Caucasus*, must be generally cover'd with the same Crust (unless the Storms and Waves wash'd it down again after its first settling upon any of them) as the Observations shew they really now are.

Corollary 1. 'Tis hence evident, even abstractedly from the Sacred History, that there has formerly been an Universal Deluge, much higher than the generality of the Mountains. So that hereafter, since the so useful Observations of Naturalists, and principally of Dr. Woodward hereto relating, we need not endeavour to secure the Credit and Veracity of the Mosaick History of the Deluge by Ancient Records, and the universal Attestation of Antiquity; (which Testimonies yet are too evident and numerous to be denied) but may from our own Eyes, at the neighbouring Mines and Coal-Pits, satisfy our selves of the exact truth of this part of the Sacred Volume, which has been so much excepted against by ill-disposed Persons. So wonderful is the Method of the Divine Wis-

Vid. Bentley's Sermon.
4-P. 34, 35.

dom in its seasonable Attestations afforded to the Sacred Scriptures ! That not only the Very Day, as we have seen, when the Flood began, assign'd by Moses may still, after more than four thousand years, be prov'd from Astronomy to have been the true one ; which the Learned are chiefly capable of judging of, and being primarily influenc'd by : But the Reality and Universality of the Deluge it self is demonstrable from such common and easie Observations, in all parts of the World, at the Neighbouring Mines or Coal-pits, that the Vulgar and Most Illiterate may be Eye-witnesses of the certain Effects of it, and so fully convinc'd of the fidelity of the Sacred Historian therein.

Coroll. 2. 'Tis no wonder that none of the Antediluvian Cities, Towns, Buildings, or other Remains are any where to be met with since the Deluge: They being all generally buried perhaps above two hundred foot deep in the Earth, by the Sediment of the Waters.

LXXIII. The Parts of the present upper *Strata* were, at the time of the Waters covering the Earth, loose, separate, divided, and floated in the Waters among one another uncertainly.

LXXIII. This Proposition needs no farther Explication ; being already plain in what has been already said.

LXXIV. All this Heterogenous Mass, thus floating in the Waters, by degrees descended downwards, and subsided to the Bottom, pretty nearly according to the Law of Specifick Gravity ; and there compos'd those several *Strata* or *Layers*, of which our present upper Earth does consist.

LXXIV. This Proposition is as easie as the former ; and included in what has been already said.

LXXV. Vast multitudes of Fishes, belonging both to the Seas and Rivers, perish'd at the Deluge ; and their Shells

Shells were buried among the other Bodies or Masses which subsided down, and compos'd the *Layers* of our upper Earth.

LXXV. Where so Heterogeneous a Mass of Corpuscles were dispers'd every where through the Waters, and towards the bottom, especially at the latter end of their subsidence, render'd the same very thick and muddy, 'tis natural to suppose, that multitudes of Fishes, partly stifled with the Spissitude and grossness of the *Fluid*, (scarce there deserving that name;) and partly poison'd with the kinds of some of those Corpuscles which they took in together with their Nourishment therein, would be destroy'd and perish in the Waters: Which being granted, the rest so easily follows as not to need any farther Explanation.

LXXVI. The same Law of Specifick Gravity which was observ'd in the rest of the Mass, was also observ'd in the subsidence of the Shells of Fishes; they then sinking together with, and accordingly being now found enclos'd among those *Strata* or Bodies which are nearly of their own Specifick Gravities: The heavier Shells being consequently still enclos'd among the heavier *Strata*, and the lighter Shells among the lighter *Strata*, in the Bowels of our present Earth.

LXXVI. This *Phaenomenon* is so natural and necessary, considering the gradual increase of the thickness of the gross Sediment downward, and the equal subjection of Shells to the Law of Specifick Gravity with all other Bodies, that I shall not insist any farther upon it.

Corollary. *This single Phaenomenon of the Shells of Fish inclos'd in the most Solid Bodies, as Stone and Marble, and that all over the World, according to their several Specifick Gravities, at great depths within the Bowels of the Earth; which is so strange in it self,*

self, so surprizing to the Spectators, and so unaccountable without the most unusual and precarious Miracles be introduc'd, on any other principles; and yet so easily and naturally solv'd in the Hypothesis before us; is a strong, I had almost said an Invincible Argument for the verity thereof; and as undeniable as a Physical assertion is capable of: That is, 'Tis (as far as we can in reason pronounce) without a Miracle, certainly true.

LXXVII. The *Strata* of Marble, of Stone, and of all other solid Bodies, attained their solidity as soon as the Sand, or other matter whereof they consist, was arriv'd at the bottom, and well settled there. And all those *Strata* which are solid at this day, have been so ever since that time.

LXXVII. Seeing this upper Crust or Sediment was compos'd in great part of the Earthy Corpuscles or Masses of a *Chaos*, as well as the Primitive Earth was at the *Mosaic* Creation: The very same reasons assignable for the coalescence and consolidation of the former, are equally to be suppos'd in the present case, and render it equally reasonable with the other. And if the Dense Fluid, or any parts or steams from that were instrumental to the Original Union of parts at the Primary Formation of the Earth, 'tis probable there was no want of it at the Deluge; The *Atmosphere* of the Comet, and the Fountains of the Deep, being both capable of supplying sufficient quantities, among the larger plenty of their Watery and Earthy Masses; as is plain from what has been already said. Neither in case some of it were acquir'd by the means aforementioned, is it to be expected that we ought to see it still on the Face of the Earth, as we do the Ocean. For seeing this *Dense Fluid* is much
heavier

heavier than Water or Earth, it would be at the very bottom of all, and so either be inclosed in the Pores and Caverns at the bottom of the Sediment, or transform'd into a different Body by its composition with the Earthy parts it was enclos'd withal, and did consolidate.

LXXVIII. These *Strata* of *Stone*, of *Chalk*, of *Cole*, of *Earth*, or whatever matter they consisted of, lying thus each upon other, appear now as if they had at first been parallel, continued, and not interrupted: But as if, after some time they had been dislocated and broken on all sides of the Globe, had been elevated in some, and depress'd in other places; from whence the Fissures and Breaches, the Caverns and *Grotto's*, with many other irregularities within and upon our present Earth, seem to be deriv'd.

LXXVIII. When the Sediment settled down gradually upon the Surface of the Ancient Earth, it would compose *Strata* or *Layers* as even, continued, and parallel as one could desire, and as the said Surface did permit. And had the said Surface been fix'd and unalterable, this evenness and parallellism, this uniformity and continuity of the *Strata* would have remain'd unalterable also to this day. But since, as we have formerly shewn, the intire Orb of Earth was at the beginning of the Deluge crack'd, chap'd, and broken; and for many years afterwards would by degrees settle and compose it self towards its former figure and rotundity again; tho' the Series and Connexion of the *Strata* might before they were consolidated, be as regular as you can imagine, yet when the *Basis* or Foundation on which they rested, and the Surface on which they were spread fail'd by degrees, in several places, and proportions, by the rising of some Columns upwards, and the settling of others downwards,
this

this Upper Orb or Crust, where the *Strata* were not become intirely Solid, like Stone and Marble, must follow in great part the fate of the other, and be dislocated, elevated, or depress'd in correspondence to that whereon it rested: And have thereby a Set of Chaps and *Fissures* directly over-against those which were before in the Ancient Earth. But as for such places where the new *Strata* were become Stony or Solid, and incapable of a compliance with the under Earth, by the settling downward or elevation of its immediate *Basis* the Primitive Earth, those *Caverns* and *Grotto's*, those *Caves* and *Hollows* which appear within the Earth, or its Mountains, would naturally arise; while the Solid *Strata*, like Beams or Arches, sustain'd the impending Columns, notwithstanding the sinking and failure of their immediate Foundations; by which Causes the Surface and Upper Regions of the Earth would become very uneven, and full of small irregularities, such as the present *Phænomenon* assures us of.

Corollary 1. Hence we see a plain Reason why Mountainous and Stony Countries are only or principally Hollow and Cavernous: Some lesser Mountains being perhaps occasion'd by the subsidence of the neighbouring Columns, and the Caverns they enclose thereby produc'd; and the Solidity of the *Strata* being the proper Cause of such Caverns in other Cases: Of which the softer, more loose, and pliable Earth was accordingly incapable.

Corollary 2. Tho' the Ancient Earth were settled, and become uneven in the same degree, and in the same places as the present is; and that before the consolidation of the new Sediment; yet the Series of the several *Strata* one under another on each side of any *Fissure*, would in some measure correspond to one another,

ther, as if the consimilar Strata had once been united, and had afterwards been broken and sunk down unequally; as is manifest from the consimilar situation and subsidence of the consimilar Corpuscles; whereby the like order and crassitude of each Stratum might be still preserv'd, tho' not so exactly, as if the sustaining Surface had been even and smooth when the Sediment compos'd those Strata, and the Fissures had afterward been made through both Orbs at once, and caus'd such inequality.

Coroll. 3. Hence would arise mighty and numerous Receptacles of Water within the Earth, especially in the Mountainous parts thereof. For usually where a solid Stratum sustain'd the Earth above, while the parts beneath sunk lower, and thereby produc'd a Cavern, the Waters would ouze and flow into it from all quarters, and cause a conflux or inclosed Sea of Waters in the Bowels of the Earth: Which Cavities might sometimes communicate with one another, or with the Ocean; and sometimes contain Restagnant Waters, without any outlet: All which are very agreeable to the present Phenomena of the Earth.

Coroll. 4. Hence appears the Reason of the raging of Earthquakes in Mountainous Countreys, and of the bursting forth and continuation of Volcano's there. For these Caverns, which we have observ'd the Mountainous Countreys to be mainly liable to, are fit to receive and contain together Nitrous and Explosive, Sulphureous and Inflammable steams, in great quantities; and withal to admit the Air to fan, and assist that Explosion or Inflammation, which seems to be the occasion of those dreadful Phenomena in our present Earth.

Coroll. 5. If therefore there be no o'ber Caverns than these accounted for just now, and taking date from the Deluge; 'tis very probable there were few or no Volcano's or Earthquakes, so much depending on them, before the Flood.

Coroll. 6.

Coroll. 6. In case what has been, or might farther be said, be not found sufficient to account for some observations made, concerning the inward parts of our Earth; but Dr. Woodward's Hypothesis of the Disruption of the before united Strata, by a general Earthquake, or the explosive force of the Steams of Heat ascending from the Central parts, be found necessary; such a supposition will by no means disagree with the present Theory. For when the Subterraneous ascending Steams were every way stop'd, and their ordinary course from the Central to the Superficiary Parts obstructed, by the new Sediment or Crust growing fast and sealed, and in some places Stony and Impenetrable; they would be every where preternaturally assembled, especially in the cracks, breaches and fissures of the Ancient Earth, in greater quantities than usual, and so might by a violent Rarefaction, or Explosion, burst through the Upper Crust, and cause all those Fissures, little Hills, Caverns, Grotto's, and Inequalities which Dr. Woodward's Observations require, and this Proposition takes notice of. In this case therefore the particular and distinct consideration of the Phenomena, must determine and arbitrate between the former more natural and gentle, and this latter more violent and extraordinary method of accounting for the present face of Nature upon and within the Earth.

LXXIX. Great numbers of Trees, and other Vegetables, were also, at this subsidence of the Mass aforesaid, buried in the Bowels of the Earth: And such very often as will not grow in the places where they are lodg'd: Many of which are pretty intire and perfect, and to be distinctly seen and consider'd to this very day.

Solut. 56.
prius.

LXXIX. Seeing the latter part of the Deluge, after the seventeenth day of the seventh Month, or the twenty seventh day of March with us at present,

present, was very Windy, Stormy, and Tempestuous; the most Extant and Mountainous parts of the Earth would be mightily expos'd to the fury both of the Winds and Waves: Which consequently would tear up, or wash away the loose and unsolid Upper Earth, with all its Furniture of Trees and Plants; and not seldom carry them great distances from their former Seats. Now these Vegetables, if no *Earthy Metallick* or *Mineral* Masses adher'd to them, being, bulk for bulk, lighter than the *Earthy Sediment*, would settle down last of all, and would lye upon the Surface of the Earth, and there rot away and disappear. But if considerable quantities of the heaviest *Strata*, or of *Metallick* or *Mineral* Matter, as would sometimes happen, adher'd to them, they would sink lower, and be inclosed in the Bowels of the Earth, either near to, or far from the place of their own growth, according as the Billows and Storms happen'd to dispose of them. All which Changes and Dislocations of the Soil and Surface, with their Fruits and Plants, might leave once Fertile Countries Bare and Barren; and lodge such Vegetables in others, which of themselves, before the new Sediment, much more since the same, were wholly incapable of such productions; according to the exigency of the Proposition before us.

LXXX. It appears from all the tokens and circumstances which are still observable about them, That all these Vegetables were torn away from their ancient Seats in the Spring time, in or about the Month of *May*.

LXXX. When we have already prov'd, that the Windy and Stormy Weather which tore up these Vegetables, did not begin till the seventeenth

Solut. 56.
prius.

teenth day of the seventh Month from the Autumnal Equinox; answering to our *March* the twenty seventh now; and when it appears that the higher any Mountain or Continent was, the less while, and in a less degree would the Waters prevail upon it; and so little sometimes as not wholly to destroy the growing Vegetables, at this due time of the Year; 'tis evident that whether the Sediment were newly settled, and had enclosed them or not, so many as were torn up from these highest parts of the Earth must be in that forwardness as the Months succeeding the beginning of the Storms (*April, May and June*) usually bring them to, very agreeably to the Proposition before us. And that we have rightly supposed these *Fossil Plants* to have been such as grew on the elevated parts of the Earth only, (how far distant soever the fury of the Waves and Storms may have lodged them) and so to have been torn up by the Storms in the assigned manner, appears both by the heaps in which they are frequently found crowded together, and by the kinds of Plants thus buried in the Earth: Of which latter, (tho' his opinion, according to his own *Hypothesis* be, that all sorts were originally lodged in the Earth, tho' some be since perished) Dr. Woodward's words are (in his kind and free Letter, in answer to my Queries about them) *The Fossil Plants are very numerous and various, and some of them intire, and well preserv'd. I have met with many of the same Species with those now growing on our Hills, Woods, Meadows, Heaths, &c. But none of the Water-Plants; I mean such as are peculiar to Lakes, Rivers, and the Sea. Which Testimony is a peculiar Confirmation of the present Hypothesis.*

Corollary.

Corollary. Hence the *Ancient Years* beginning at the Autumnal Equinox, and the consequent commencing of the Deluge, the seventeenth Day of the second Month from thence, and not from the Spring, is evidenc'd by this very Observation which Dr. Woodward, the Author thereof, supposes wou'd prove the contrary. So that the time of the Deluge's commencing assign'd by our Hypothesis, appears at last to be confirm'd both by the Scriptures, by the Ancients, by Astronomy, by Geography, and by Natural Observation; and is consequently by so very remarkable a Concurrence and Correspondence of 'em all, put beyond any reasonable Doubt or Scruple.

LXXXI. All the *Metals* and *Minerals* among the *Strata* of our upper Earth, owe their present Frame and Order to the Deluge; being repos'd therein during the time of the Waters covering the Earth; or during the Subsidence of the before-mention'd Mass.

LXXXI. This can have no difficulty in it, seeing our upper Earth is *factitious*, and compos'd of the foresaid Sediment of the Waters of the Deluge; which including the *Corpuscles* of *Metals* and *Minerals*, as well as others, wou'd alike afford every one those places which they have ever since possess'd.

LXXXII. These *Metals* and *Minerals* appear differently in the Earth, according to the different manners of their first Lodgment: For sometimes they are in loose and small Particles, uncertainly inclos'd among such Masses as they chanc'd to fall down withall: At other times, some of their *Corpuscles* happening to occur and meet together, affix'd to each other; and several convening, uniting, and combining into one Mass, form'd those *Metallick* and *Mineral Balls* or *Nodules* which are now found in the Earth. And according as the *Corpuscles* chanc'd to be all of a kind, or otherwise, so the Masses were more or less simple, pure, and homogeneous: And according as o-

* ther Bodies, Bones, Teeth, Shells of Fish, or the like, happen'd to come in their way, these Metallick and Mineral Corpuscles affix'd to, and became conjoin'd with 'em; either within, where it was possible, in their Hollows and Interstices; or without, on their Surface and Outfides; filling the one, or covering the other. And all this in different Degrees and Proportions, according to the different Circumstances of each individual Case.

LXXXII. All these things are but proper Effects of such a common Subsidence of all these Masses and Corpuscles together in the *Chaotick* Sediment as is above-mention'd: And no longer or more particular Account is necessary, or can be satisfactory, till Dr. *Woodward's* larger Work (which we in time hope for) affords us the Observations more nicely and particularly than we yet have them. To which, therefore, the Inquisitive Reader must be refer'd in this and the like Cases.

LXXXIII. The inward parts of the present Earth are very irregular and confus'd: One Region is chiefly Stony, another Sandy, a third Gravelly: One Country contains some certain kinds of Metals and Minerals; another contains quite different Ones: Nay the same Lump or Mass of Earth not seldom contains the Corpuscles of several Metals or Minerals confus'dly intermixt one with another, and with its own Earthy Parts. All which Irregularities, with several others that might be observ'd, even contrary to the Law of specifick Gravity, in the placing of the different *Strata* of the Earth, demonstrates the original Fund or Promptuary of all this upper factitious Earth, to have been in a very wild, confus'd, and *Chaotick* Condition.

LXXXIII. Seeing the Sediment of the Waters was compos'd of what Earthy Matter was uncertainly brought up out of the inner Earth, and of what a true and proper *Chaos* afforded, these

these *Phænomena* are as natural and accountable therefrom, as on any other mechanical *Hypothesis*, they must appear strange, perplexing, and inexplicable to Philosophick Minds.

LXXXIV. The uppermost and lightest *Stratum* of Soil or *Garden-Mold*, as 'tis call'd, which is the proper Seminary of the Vegetable Kingdom, is since the Deluge very thick spread usually in the Valleys and Plains, but very thin on the Ridges and Tops of Mountains: Which last for want thereof are frequently stony, rocky, bare, and barren.

LXXXIV. Two plain reasons are to be given for this *Phænomenon*; (1.) The quantity of Water, and its Sediment; and by consequence of Soil or fertile Earth was less over the Mountains than over the Plains and Valleys. (2.) After the Subsidence of the Sediment, and before its entire Consolidation, the Tops of Mountains were most expos'd to the fury of the Winds and Storms; which wou'd therefore more easily bear away that lightest and least united *Stratum* which lay uppermost in those bleak places, than in the more retir'd and skreen'd Plains and Valleys; and by diminishing the Soil in the former, and thereby augmenting it in the latter places, most easily make all things correspond in this Proposition.

LXXXV. Of the four ancient Rivers of Paradise, two still remain in some measure; but the other two do not; or at the least are so chang'd that the *Mosaic* Description does not agree to them at present.

LXXXV. That the great Rivers wou'd still retain in great measure their old Courses, has been observ'd already; and seeing the Foun-

Hypoth. 4.
Prius.

tains, and the general inequalities of the Earth, on which their Origin and Channels depend, were the same generally before as since the Deluge, there can be no doubt thereof. As to the change, with reference to the other two Rivers, If the Gulph of *Persia* were anciently free from Waters, and were no other than the very Country of *Eden*; and if the very Entrance of that Gulph into the *Persian* Sea were the *Garden of Eden*, or *Paradise*, as has been before asserted, there can be no difficulty in the case: The Channels of these Rivers, and indeed of their Fellow-Branches too after their last Partition, being now under Water, and not to be enquir'd after. But tho' we shou'd allow that *Paradise* was where 'tis generally placed, near *Babylon*, and upon the Continent, yet will there be no wonder at the disappearance of these two Rivers, which, with their Fellows, are bury'd to a sufficient depth under the Sediment we have been speaking so much of before; and so no more to be enquir'd after in this than in the former Case.

LXXXVI. Those *Metals* and *Minerals* which the *Mosaic* Description of *Paradise*, and of its bordering Regions, takes such particular notice of, and the Prophets so emphatically refer to, are not now met with so plentifully therein.

LXXXVI. The present upper Earth being, as we have seen, *factitious*, and a new Crust since the Flood covering over the ancient Surface thereof, those Primitive Treasures must lie too deep in the Bowels of the present Earth, to be easily approach'd by us, and so are entirely lost as to the use or enjoyment of Mankind.

LXXXVII.

LXXXVII. This Deluge of Waters was a sign alin-
stance of the Divine Vengeance on a wicked World,
and was the effect of the peculiar and extraordinary
Providence of God.

LXXXVII. Tho' the passing by of a Co-
met, and all those Effects of it in the drown-
ing of the World, of which we have so large-
ly discours'd hitherto, be not to be stil'd in the
common use of the Word *Miraculous*; (tho' in
no very improper Sense, all such Events may
have *that* Appellation, of which before) yet is
there the greatest reason in the World to at-
tribute this mighty *Turn* and *Catastrophe* of Na-
ture, to the Divine Providence, and the imme-
diate, voluntary, actual, interposition of God;
and that in these ensuing Particulars, and on
these following Accounts; which I shall be the
shorter upon, as having in the place fore-men-
tion'd explain'd my Mind somewhat largely
about things of this Nature. (1.) The Bodies
made use of in this and the like Changes of
Nature, are originally the Creatures of God,
and continually preserv'd by Him; and so what
they are instrumental in, ought most justly to
be ascrib'd to the principal Cause, the great
Creator and Conservator of 'em all. (2.) All
those Powers of Attraction or Gravitation, &c.
and those Laws of Motion by which these
Bodies are capable of producing such Effects,
are alike owing to the Divine Operation, Ap-
pointment, and Efficacy; both in their primi-
tive Impression, and continual Energy;
and so still the Effects themselves are to be a-
scrib'd to a Divine Original. (3.) That parti-
cular Constitution of the Earth on the Face
of the fluid Abyss, and other such Dispositions,

Vol. So-
lut. 2.
prius.

whereby it became subject to a universal Deluge, were also the Consequents of the Divine Power and Providence in the formation of the Earth. (4.) That peculiar Situation or Constitution of the Orbits and Motions of Comets, whereby they, by reason of their passing thro' the Planetary System each Revolution are fit to cause such great Mutations in it, was the Effect of the particular Order and Disposition of God, in the primary frame of the Universe. (5.) The Coincidence of the Plain of a Comet's Orbit with that of the Ecliptick, can have no other Foundation in Nature, than a like design'd and contriv'd Appointment of God. (6.) The way of the Comet's Motion from East to West, contrary to that of the Planets, by which the Particulars of the Deluge were in good Measure provided for, could also be nothing but the Effect of the same Design and Providence of God. (7.) The so nice and exact adjustment of the Motions of both the Comet and the Earth; that the former shou'd pass just so near, and impart such a certain quantity of Waters, and not more or less than wou'd drown the World, and just cover the highest Mountain, and yet reach no farther; in short, as wou'd secure the Ark for future Generations, and yet not leave one dry-land Animal besides alive; this exactness is a most peculiar and strange Effect of the most wise and sagacious Providence of God in this mighty Revolution. But (8.) Lastly, (to omit repeating some things before observ'd as we pass'd along) The precise time of the passing by of the Comet, and thereby of destroying the World, is, in the most peculiar manner, and highest degree, the result of the

the Divine Providence. That exactly at a time which was fit and proper, and in an Age that justly deserv'd so great a Judgment, the Comet shou'd come by, and over-whelm the World, is very remarkably and extraordinarily the Finger of God himself. That Omniscient Being, who foresaw when the degeneracy of Human Nature wou'd be arriv'd at an *unsufferable* degree of Wickedness, the Iniquities of the World wou'd be compleatly *full*; and when consequently his Vengeance ought to fall upon them, prædispos'd and præadapted the Orbits and Motions of both the Comet and the Earth, so that at that very time, and only at that time, the former shou'd pass close by the latter, and bring that dreadful Punishment upon them. Had not God Almighty on purpose thus adjusted the Moments and Courses of each, 'twere infinite odds that such a Conjunction or Coincidence of a Comet and a Planet, wou'd never have happen'd during the whole space, between the Creation and Conflagration of this World; much more at such a critical Point of time when Mankind, by their *imparallell'd* Wickedness were deserving of, and only dispos'd for this *imparallell'd* Vengeance, no less than almost an *utter Excision*.

And this I take to be the Secret of the Divine Providence in the Government of the World, and that whereby the Rewards and Punishments of God's Mercy and Justice are distributed to his Rational Creatures, without any disturbance of the settled Course of Nature, or a miraculous interposition on every Occasion. Our Imperfection is such, that we can only act *pro re natâ*, can never know before-hand the Behaviour or Actions of Men;

neither can we foresee what Circumstances and Conjunctions will happen at any certain time hereafter ; and so we cannot provide for future Events, nor prædispose things in such a manner that every one shall be dealt with, or every thing done no otherwise than if we were then alive and present, we shou'd think proper and reasonable, and shou'd actually do. But in the Divine Operation 'tis quite otherwise : God's Præscience enables him to act after a more sublime manner ; and by a constant Course of Nature, and Chain of Mechanical Causes, to do every thing so as it shall not be distinguishable from a particular Interposition of his Power, nor be otherwise than on such a particular Interposition wou'd have been brought to pass. He who has created all things, and given them their several Powers and Faculties, foresees the Effects of 'em all : At once looks through the intire Train of future Causes, Actions, and Events, and sees at what Periods, and in what manner twill be necessary and expedient to bring about any changes, bestow any Mercies, or inflict any Punishments on the World : Which being unquestionably true, 'tis evident he can as well provide and prædispose natural Causes for those Mutations, Mercies, or Judgments before-hand ; he can as easily put the Machin into such Motions as shall, without a necessity of his mending or correcting it, correspond to all these foreseen Events or Action, as make way for such Alterations afterward by giving a random force to the whole : And when these two ways are equally possible, I need not say which is most agreeable to the Divine Perfections, and most worthy of God. So that when the Universal

verfal Course of Nature, with all the Powers and Effects thereof, were at first deriv'd from, and are continually upheld by God; and when nothing falls out any otherwise, or at any other time, than was determin'd by Divine Appointment in the Primitive Formation of the Universe: To assign *Physical* and *Mechanical* causes for the Deluge, or such mighty Judgments of God upon the Wicked, is so far from taking away the Divine Providence therein, that it supposes and demonstrates its Interest in a more Noble, Wise, and Divine manner than the ^{bringing} in a miraculous Power wou'd do. Let us suppose a *Fulmen* or Thunderbolt originally, and on purpose, put into such a Motion, as without any farther Interposition of Providence, wou'd direct it to the Head of a Blasphemer; and whilst he was cursing his Maker, strike him dead upon the Spot; which the Præscience and Power of God shew to be equally possible with a present Miracle: I think such a violent Death wou'd be as properly *extraordinary*, and a *Divine Judgment*, as any other whatsoever: Which I take to have been the very case of the Deluge, which I am here peculiarly concern'd about. Nature is God's Constitution, and ever subservient to him; and the state of the *Natural* is always accommodated to that of the *Moral* World. What is done by Nature, and second Causes, is most properly done by God at last, who is ultimately and really almost all we can mean by those Names.

Corollary. *What has been here said upon this Occasion, if rightly understood and apply'd to all other Cases, would clear our Minds from many*
of

of those Perplexities about the Divine Providence which are ready to disturb 'em. For Instance: We pray to God for fruitful Seasons, for Health, for Peace, for the Success of our Endeavours, for a Blessing on our Food and Physick, and deprecate the contrary Miseries from us. Yet at the same time we see the Seasons depend on the settled Course of the Sun, or other natural and necessary Causes; we find our Health or Sickness to be the proper Effects of our Diet and Regiment; we observe Peace and War subject to the Intrigues of Princes, and the plain Results of visible Conjunctions in Humane Affairs; we know that Worldly Prudence and Cunning has a main Stroke in the Success of Mens Labours; we feel the advantageous Effects of some Food and Physick, and have Reason to believe the same does very much result from the Goodness of the Druggs, the Fitness of the Proportion, the Disposition of the Body, and the Skill of the Physician, and can frequently give a plain and mechanical Reason of the different Operations of all those things; neither do we hope for the Exercise of a miraculous Power in these or the like Cases. The Consideration and Comparisen of all these things together frequently puzzles the Minds of good Men, especially those that are more Contemplative and Philosophical, and makes 'em wonder what Interest our Devotions, or what Advantage our Prayers can have. Second Causes will work according to their Natures, let Mens Supplications be never so importunate: And to expect a Miracle in answer to every Petition, is more than the most Religious dare pretend to. This Dilemma has had a contrary Effect upon the Minds of Men, while the Philosopher was in Danger of doubting of the Success, and so ready to grow cold in his Devotions, and the more unthinking, yet not less religious Man

re?

rejected the Consideration of the Manner, or the Operation of second Causes, and more wisely look'd up only to God, and imagin'd him immediately concern'd in every Occurrence, and on that Principle doubted not the Effect of his Prayers. But 'tis, methinks, evident that neither of these were exactly in the Right; and equally so, that the due Consideration of what has been above-said, would prevent the Dilemma, and take away all reasonable Scruple. 'Tis true that Natural Causes will operate as usual: 'Tis also true that Miracles are not ordinarily to be expected: But withal 'tis as true that the same all-wise Creator, who appointed that constant Course of Nature, foresaw at the same time all those Dispositions of Men, and in particular those Devotions of his Worshipers, to which suitable Rewards were to be provided, and suitable Answers return'd; and therefore has so order'd the Series of Natural Causes, as to make that very Provision for the same which otherwise he would have done by the miraculous Interposition of his Providence; and which therefore is equally to be ascrib'd to him with the greatest Wonders. 'Tis true, the Frame of Nature is now constant and settled: But 'tis true also that it was so settled on the Prospect of the moral Behaviour, and in Correspondence to the good or bad Actions of Mankind, foreseen and præsupposed in the Primitive Constitution of all; and by Consequence whatever Benefits or Afflictions the constant Course of Nature and second Causes bring to us, are equally capable to be the Matter of our Prayers or Deprecations of our Humiliation or Gratitude before God, as the immediate Effects of a miraculous Power; and the Divine Providence no less to be acknowledg'd and address'd to in the former than in the latter Case: But because our Imperfection is so great that the Consideration of the
Pri-

Priority of the future Actions, Men to the Præscience of God in the Order of Nature; and the Dependence of the latter on the former, is too high for our Comprehension, and tho' demonstrable by, yet inscrutable to the Reason of Mankind; and because we are therefore still ready to conceive what is fore-known by God to be necessary and inevitable; let the moral Behaviour of Men be as it will: Because I say this Præscience of God is too Divine a thing to be easily penetrated and aply'd by us to all Occasions. I confess 'tis the most obvious and the most prudent, as well as the most Scriptural Way to keep within our Faculties, and alway to suppose an immediate Exerting of a new Power in every new Turn in the World, and without the troublesome Inquisition into the Nature and Design of the Primitive Constitution of the Material World, to refer all things to an immediate Providence: Into which every one must ultimately and originally be resolv'd, and which has as well and as congruously taken care of all Events, as if such a miraculous Efficiency were really concern'd on every individual Occasion. Which whole Matter thus explain'd may be of Use to those who through the not understanding the Method of the Divine Providence, and its Consistency with an uninterrupted Course of Nature, have perplex'd their own Minds, and endanger'd their Religion: Which pernicious scruples true Philosophy, when rightly understood, is the only Means of dispelling and preventing. Nothing being more true or momentous than this, that 'Tis as ever our Ignorance or Mistakes only, that fully the Providence of God, or diminish our Religious Affections to him.

LXXXVIII. Tho' the Moon might perhaps undergo some such Changes at the Deluge as the Earth; yet that Face or Hemisphere which is towards the Earth, and which is alone expos'd to our View, has not acquir'd any such gross Atmosphere or Clouds, as our Earth has now about it, and which are here suppos'd to have been acquir'd at the Deluge.

LXXXVIII. Seing the *Moon* appears to be of a Constitution so like that of the Earth, and seeing she is so near a Neighbour and constant Companion thereof, she seems at first Sight liable to the same *Catastrophe* with the Earth at the Deluge. But that we may consider how far the Comet could affect her, we must remember that at the first Passage of the Comet, Her Situation seems almost dispos'd to convey her just after the Earth along that large void *Cylindrical* Space, whose Vapours the Earth had intercepted, and born away before it, as by comparing the 2d and 4th Figures is easie to understand. Besides, tho' she caught her Share of the Vapours from the Atmosphere and Tail of the Comet, yet her Mountains are so much higher, compar'd with those on Earth, that at the most only an inconsiderable Inundation of Waters on one Hemisphere, not an universal Deluge were to be suppos'd: For, lastly, by Reason of the Slowness of her Diurnal Revolution those Vapours which were caught by one Hemisphere (and indeed by very little more than one at the utmost) would fall near the same Places in Rain, which they at first fell upon when Vapour; and still affect little more than a single Hemisphere thereof. So that the most that can be suppos'd of the *Moon's* Deluge, is, that the lower Grounds on one Hemisphere should be overflow'd; especially if we except the second Passage through the

Lem. 39.
prius.

the Tail of the Comet after its *Perihelium* : For it must be confess'd that those secondary and less principal Rains of about 97 Days Continuance, which we before observ'd the Earth to have been liable to, must needs be allow'd to have affected the Moon also ; and seeing from them the Impurities and Commotions of our Atmosphere appear to have been deriv'd, it seems at first View necessary that the Moon should have acquir'd such a gross Atmosphere, such Clouds and Meteors as we saw the Earth did at the same time ; which looks very unlike to her *Phænomena*, or the latter Part of this Proposition we are now upon. But this Difficulty which at first sight seems so formidable, will intirely vanish if we observe the then Position of the Moon, and thence consider which Hemisphere would be affected therewith. For (as we before in Part observ'd) the Moon wanted but two or three Days of the New, when she with the Earth pass'd the second time thro' the Tail of the Comet ; and by Consequence the Vapours ascending from the Sun fell pretty exactly upon that Hemisphere of the Moon, which is never expos'd to the Earth ; without Affecting that which we can observe, and with which we are alone concern'd. In a Word, in this second Passage, the Moon ought to have acquir'd a gross Atmosphere on the opposite Hemisphere and its bordering Parts, the Limb of her Body, while the visible Hemisphere retain'd its ancient Purity and Clearness : The latter Part of which is known to be true ; and if the Reader consults the Right Reverend and Learned Author quoted in the Margent, he may see reason to esteem the other very probable also ; which is, I think, abundantly sufficient to clear this Matter.

LXXXIX.

Coral. 5.
Schol.
post Hypoth. 10.
prius.

Bp. Wilk.
New
World.
Lib. 1.
Prop. 10.

LXXXIX. Since the Deluge there neither has been, nor will be any great and general Changes in the State of the World, till the time when a Period is to be put to the present Course of Nature.

LXXXIX. Seeing we know no other Natural Causes that can produce any great and general Changes in our Sublunary World, but such Bodies as can approach to the Earth, or, in other Words, but Comets; and seeing withal, the next Approach of the Comet, will, in probability, bring the present State of things to a Conclusion, and *Burn* the World; of which presently: 'Tis evident the Earth is secure enough all the intermediate space: And as hitherto we accordingly find it has been, so we need not fear but it will be, preserv'd till the foremention'd *Conflagration*.

C H A P. V.

Phænomena relating to the General Conflagration: with Conjectures pertaining to the same; and to the succeeding Period, till the Consummation of all things.

XC. **A**S the World once perish'd by *Water*, so it must by *Fire* at the Conclusion of its present State.

XC. As we have given an Account of the *Universal Deluge* from the Approach of a Comet in its descent towards the Sun; so will it not be difficult to account for the *General Conflagration* from the like Approach of a Comet in its ascent from the Sun. For 'tis evident from what has been already explain'd, that in case a Comet pass'd behind the Earth, tho' it were in its Descent, yet if it came near enough, and were it self big enough, it wou'd so much retard the Earth's annual Motion, and oblige it to revolve in an *Ellipsis* so near to the Sun in its *Perihelion*, that the Sun it self wou'd scorch and burn, dissolve and destroy it in the most prodigious degree; and this Combustion being renew'd every Revolution, wou'd render the Earth a perfect *Chaos* again, and change it from a Planet to a Comet for ever after. 'Tis evident *this* is a sufficient cause of a general Conflagration with a Witness; and

and such an one as wou'd intirely ruine the Make of the present, and the possibility of a future World. On which last account, if we allow the following *Phænomena*, we must not introduce *this*, at this Period however; but see whether a Conflagration of a less destructive, and more refining Nature, be not to be expected, and may not be accounted for. And here let it be observ'd, that the Central Heat of it self seems sufficient to burn up, and dissolve the upper Earth, (as those who, with Dr. Woodward, know the Power and Vehemence of the same now, and its astonishing Force, and terrible Effects in Earthquakes, Eruptions of *Volcano's*, and other *Phænomena* of present Nature, ought to allow) if these two things were by any means remov'd; I mean the *Waters* of the Seas and Ocean, and the *Coldness* of the Air: For 'tis the vast quantity of Waters of the Earth, and the Coldness of the middle Region of the Air every where, and of the whole Air in the *Frigid Zones*, returning the Vapours *cold down* again, which were sent up into 'em never so *hot*, which seems still to prevent the effects of the Subterraneous Heat, and to hinder the Conflagration of the Earth. If therefore the passing by of a Comet be capable of emptying the Seas and Ocean, and of rendring the Air, and its contiguous upper Surface of the Earth extreamly hot and inflam'd, no more, I suppose, will be necessary to a general Conflagration: Or if any more Assistance be afforded by the Presence of the Comet, it will be *ex abundanti*, and only contribute still the more certainly, and the more suddenly, to kindle such a fatal Fire, and so dreadful a Combustion. Now that both those

requisite conditions for a general Conflagration wou'd be the consequents of this Passage of the ascending Comet, is plain and evident: For (1.) on the Approach of the Comet, a vast Tide wou'd arise in the great *Abyss*; and by the new, more considerable, and more violent Elevations thereof into the Protuberances, and the *Sphaeroid* Surface of the whole, the old *Fissures* and Breaches wou'd be open'd again, and not a few new ones generated; not only, as at the Deluge, in the Mountainous or more loose Columns, extant above the Surface of the Waters of the Globe; but in all Parts, and under the Seas and Ocean, as well as in other places; which *Fissures* must immediately swallow up the main Mass or Bulk of the Waters upon the Face of the Ground, and send 'em to their Fellow-Waters in the Bowels of the Earth; which was the first and principal step towards a general Conflagration. And then (2.) the Vapours acquir'd from the Comet's Atmosphere, which at the Deluge were, by reason of their long absence from the Sun in the remote Regions beyond *Saturn*, pretty cool; at this time must be suppos'd, by reason of their so late and near approach to the Sun about the *Perihelion*, exceeding hot and burning; and that to so extraordinary a degree, that nothing but the *Idea* of the Mouth of a *Volcano*, just belching out immense quantities of liquid and burning Streams, or Torrents of fiery Matter, can in any measure be suitable to the Violence thereof. Imagine, therefore, the Earth to pass through the very middle of this Atmosphere, for 7000 or 8000 Miles together, and to bear off with it a *Cylindrical* Column thereof,

thereof, whose *Basis* were somewhat larger than a great Circle on the Earth, and whose Altitude were the Number of Miles just now mention'd; and then tell me whether the Air, and its adjoining uppermost Region of the Earth, will not be sufficiently hot and scorching; which was the other Step to the general Conflagration. Besides all which, what quantities of this fiery Exhalation, or Torrent of melted liquid Matter wou'd run down the *Fissures* into the Bowels of the Earth, and by joining with the central hot Steams already there, invigorate them, and accelerate the direful Inflammation; and what piercing and scorching fiery Corpuscles the central Body it self during its vicinity, wou'd also send out; and what an additional Power wou'd thereby be afforded the prevailing Heat, I need not say. Upon the whole, I may appeal to the Reader, if the concurrence of all these external Causes, to say nothing here of any internal ^{vid.} Dispositions in the Earth it self thereto, do ^{Theor. 1. 3.} not appear abundantly sufficient within a little ^{c. 7. &c.} time to set the World on Fire, and bring on that terrible Conflagration which both Sacred and Profane Testimonies conspire to forewarn us of; and so whether the *Theory of Comets* does not afford us almost as commensurate and compleat an Account of the *last burning*, as it already has done of the *ancient drowning* of the Earth.

XCI. The same Causes which will set the World on Fire, will also cause great and dreadful Tides in the Seas and Ocean; with no less Agitations, Concussions, and Earthquakes in the Air and Earth.

XCI. Seeing the Eruption of the central Heat, (the cause, 'tis probable, of all our Earthquakes) the presence of a Comet, (the cause once already of the most prodigious Tides that ever were) and the inflam'd *Chaos*, or scorch'd Atmosphere of the Comet, (a smaller part of which occasion'd all our Tempests, our Meteors, our Thunder and Lightning ever since the Deluge) will all concur at once, and with joint Forces conspire together; nothing in the World can be suppos'd more terrible, nor more exactly correspondent to the *Phænomenon* before us.

XCII. The Atmosphere of the Earth, before the Conflagration begin, will be oppress'd with Meteors, Exhalations, and Steams; and these in so dreadful a manner, in such prodigious quantities, and with such wild confus'd Motions and Agitations, that the Sun and Moon will have the most frightful and hideous Countenances, and their ancient Splendor will be intirely obscur'd: The Stars will seem to fall from Heaven; and all manner of horrid Representations will terrifie the Inhabitants of the Earth.

XCII. Those who consider how a Comet's Atmosphere appears to us after its *Perihelion*, and what large quantities of its newly scorch'd Masses our Air must be clog'd and burthen'd withal, will expect no other effects than those here mention'd; and will easily believe that all such horrible Appearances wou'd ensue, and that in the most amazing Degree, and extravagant Instances possible. The *Theorist's* Representation of this Matter will be, generally speaking, but a fair and just *Idea* thereof.

Theor.

l. 3. c. 11.

XCIII.

XCIII. The Deluge and Conflagration are referr'd by ancient Tradition to great Conjunctions of the Heavenly Bodies, as both depending on, and happening at the same.

XCIII. In our Accounts of the Deluge and Conflagration, there is a *notable* conjunction of the Heavenly Bodies indeed; not such an Imaginary one as the *Astrologers* so ridiculously make a stir about; the bare Position of two or more of the Celestial Bodies in or near the same streight Line, from the Eye of the Spectator, while they are at the most remote Distances from one another; which is a poor jejune thing indeed: But a real one with a Witness; when three of the Heavenly Bodies, the Earth, the Moon, and the Comet, not only are in an *Astrological Heliocentrick* Conjunction, or only seem to an Eye in the Sun to be conjoyn'd together, but are really so near as to have the mightiest effects and Influences on one another possible; which we have sufficiently shewn in the present *Theory*, and which does peculiarly correspond to the *Phenomenon* before us.

Corollary. 'Tis not improbable but the ancient Tradition, that the Deluge and Conflagration some way depended on certain remarkable Conjunctions of the Heavenly Bodies, mis-understood, and afterward precariously and widely mis-apply'd, might give occasion and rise to Astrology; or that mighty quail and pothor so many in all Ages have made about the Conjunctions, Oppositions, and Aspects of the Heavenly Bodies, and the Judiciary Predictions therefrom; which even the Improvements of solid Philosophy in our Age have not been able yet to banish wholly from among us; the occasion whereof is otherwise exceeding dark and unaccountable.

XCIV. The space between the Deluge and the Conflagration; or between the ancient State of the Earth and its Purgation by Fire, Renovation, and Restitution again, is from ancient Tradition defin'd and terminated by a certain great and remarkable Year, or *Annual* Revolution of some of the Heavenly Bodies; and is in probability what the Ancients so often referr'd to, pretended particularly to determine, and stil'd the *Great or Platonick Year*.

XCIV. If we allow, as we ought, that in all probability the same Comet that brought on the Deluge will bring on the Conflagration; and that the same Comet has not return'd, nor is to return, till the Conflagration; this matter is easie, and the correspondence accurate and remarkable: For this single Revolution is truly an *Annual* one, and as proper a Year with regard to the Comet, as that of our Earth is with respect to us; and so may most fitly and naturally suit the *Great or Platonick Year*, taken notice of in the Proposition before us.

XCIV. This general *Conflagration* is not to extend to the intire Dissolution or Destruction of the Earth; but only to the Alteration, Melioration, and peculiar Disposition thereof into a new State, proper to receive those Saints and Martyrs for its Inhabitants, who are at the first Resurrection to enter, and to live and reign a thousand Years upon it, till the second Resurrection, the general Judgment, and the final Consummation of all things.

Lern. 6s.
cum Co-
rol. prius.

XCIV. Seeing the *Abyss* consists of a dense and compact *Fluid*, not capable of any Rarefaction or Dissolution by the most violent Heat imaginable, 'tis evident that the causes here assign'd can only extend to the upper Orb, or habitable Earth, without any farther Progress.
So

So that the effect of this Conflagration will be the reduction of this upper Earth, and its Atmosphere, into a confus'd, mixt, and *Chaotick* State; much such an one as was before observ'd to have preceded the Original Formation of it. So that as the Heat decreases, 'tis but reasonable to expect a kind of Reiteration of the *Mosaick* six Days Creation, or a Renovation of the Primitive State of the Earth; to the Description of which therefore I must refer the Reader.

XCVI. The State of Nature during this *Millennium* will be very different from that at present, and more agreeable to the *Antediluvian*, *Primitive*, and *Paradisiacal* ones.

XCVI. This is apparent from the conclusion of the former *Solution*.

XCVII. The Earth in the *Millennium* will be without a Sea, or any large Receptacle fill'd with mighty Collections and Quantities of Water.

XCVII. The Primitive Seas depended on two things; the former, the concurrence of the Central and Solar Heat for an intire half Year together, in the Elevation of sufficient quantities of Vapours: The latter, the Earth's considerable solidity attain'd before the descent of the same Vapours which were to compose the Seas, of which we are speaking: So that if either of these be wanting in this reiterated Formation of the Earth, 'tis evident the Effect must fail, and the *Globe* be no longer a *Terraqueous* one after the Conflagration. Now the next Proposition but one, asserting the probability of the intire absence of the Sun, must infer

Solut 6 &
7. prius.

an equal probability of the entire Absence of Seas also, according as this Proposition asserts.

XCVIII. The Earth in the *Millennium* will have no Succession of Light and Darkeness, Day and Night; but a perpetual Day.

Lem. 39.
prius.

XCVIII. In case the Earth's *Diurnal Rotation*, upon which these Vicissitudes depend, was retarded so as to be only exactly equal and commensurate to its *Annual Motion*, (as the case in the *Moon's Diurnal* and *Menstrual* Revolutions is at present, as we have before observ'd) the Earth wou'd constantly expose the same Hemisphere to the Sun, (as the Moon does now to the Earth) and all succession of Day and Night for ever cease; the one half of the Globe enjoying a perpetual Day, while the other was involv'd in Darkeness, or excluded all advantages from him, and thereby enduring a continual Night, so far as natural Causes are here to be consider'd. And that this Retardation of the Earth's *Diurnal Rotation* (even without a recurring to the miraculous Power of its first Author) is accountable from that passing by of a Comet, which we assign for the occasion of the Conflagration, is very easie and obvious: For in case its Ascent and Passage be on the East side, or before the Earth; and in case it approach so near as to rub against it, 'tis evident such an Impulse is contrary to the course of the *Diurnal Rotation*, and is therefore capable (the Proportions of every thing being adjust'd by Divine Providence) of putting such a stop to the same as is necessary to the present *Phænomenon*, and so may put a Period to that constant Succession of Light and Dark-

Darkness, Day and Night, which has obtain'd ever since the Fall of Man; and withal distinguish the Surface of the Earth into two quite different and contrary Hemispheres; near the *Vertex* of one of which the Sun it self, and near that of the other, its opposite Point in the Heavens, will be always situate.

Corollary. *Seeing such a rub of the Comet wou'd affect the Annual Motion of the Earth as well as the Diurnal, 'tis possible it might retard the former as well as the latter, and reduce the Elliptical Course and Orbit of the Earth, to its ancient Circular one again.*

XCIX. The State of the *Millennium* will not stand in need of, and so probably will be without, the Light and Presence of the *Sun* and *Moon*.

XCIX. Seeing the Earth wou'd be on the foregoing Supposition distinguish'd into two quite different Hemispheres, the one of which wou'd be wholly destitute of the Light and presence of the *Sun*, and, as far as appears by *St. John*, supply'd by a Supernatural Light, fixt and permanent above its *Horizon*, 'tis clear that the first Branch of this Proposition is accountable thereby, as far as this Physical *Theory* is concern'd therein. And as to the *Moon*, seeing 'twas only a signal and peculiar Providence that caus'd her equal acceleration, and consequent accompanying the Earth at the former passing by of the Comet; and that no such Providence is again to be expected; 'tis evident that that Rub or Stoppage of the *Earth's Annual Motion*, which retards the same; and does not retard the *Moon's* also, will separate these Planets, and procure their Orbits, Courses, and Periods to be quite different from one another's
ever

ever after ; according to the greatest rigour of the present Proposition.

C. At the Conclusion of the *Millennium*, the *Final Judgment*; and the *Consummation* of all things, the Earth will desert its present Seat and Station in the World, and be no longer found among the *Planetary Chorus*.

C. If any Comet instead of passing by, or gently rubbing the Earth, hit directly against it, in its Course either towards or from the Sun, it must desert its ancient Station, and move in a quite different *Elliptick* Orbit; and so of a Planet become again a Comet, for the future Ages of the World.

COROLLARIES

FROM THE W H O L E.

I. **S**Eeing the new and solid Improvements of Philosophy do all along give so rational Accounts of those Ancient Theorems, which have been propagated down from the eldest Ages, without being then either understood, or intelligible to their Propagators; 'tis reasonable to trust and rely on such Ancient Traditions, not only Sacred, but prophane also, in these or any other parallel Cases; they being in all probability the most valuable Remains, and most venerable

nerable Truths which the primitive Parents of the World deliver'd down to their Posterity in succeeding Generations.

II. Seeing most of these Ancient Theorems are very much beyond the distinct Knowledge of those who deliver them; contrary to the common Opinion of Mankind, judging usually by sensible Appearances; and in themselves, considering the low State of Natural Knowledge at the same times, were highly improbable, if not utterly incredible to inquisitive Minds: and indeed several of them relating to the Chaos, the Creation, the primary Constitution and State of the World, and the Deluge it self, impossible to be discover'd without Supernatural Revelation; and yet seeing, after all, they do now appear as agreeable to Reason, and the most solid Mechanical Philosophy, as any new Discoveries, built on the exactest Observations of present Nature whatsoever; 'Tis apparent that these Ancient Accounts, especially those contain'd in the Holy Scriptures, were not originally deriv'd from the Natural Skill and Observation of the first Authors, or any other merely Humane Means, but from the immediate and Supernatural Revelation of God Almighty; who was therefore much more conversant with Mankind in the first, than he has been in these last Ages of the World; as the Old Testament-History assures us.

III. The Measure of our present Knowledge ought not to be esteem'd the Criterion or Test of Truth; or to be oppos'd to the Accounts receiv'd from Profane Antiquity, much less to the inspir'd Writings. For notwithstanding that several Particulars relating to the Eldest Condition of the World, and its great Catastrophe's, examin'd and compar'd with so much
Phi-

Philosophy as was till lately known, were plainly unaccountable, and, naturally speaking, impossible; yet we see, now Nature is more fully, more certainly, and more substantially understood, that the same things approve themselves to be plain, easie, and rational.

IV. 'Tis therefore Folly in the highest degree, to reject the Truth, or Divine Authority of the Holy Scriptures, because we cannot give our Minds particular Satisfaction as to the manner, nay or even possibility of some things therein asserted. Since we have seen so many of those things which seem'd the most incredible in the whole Bible, and gave the greatest Scruple and Scandal to Philosophick Minds, so fully and particularly attested, and next to demonstrated from certain Principles of Astronomy and Natural Knowledge; 'tis but reasonable to expect, in due time, a like Solution of the other Difficulties. 'Tis but just sure to depend upon the Veracity of those Holy Writers in other Assertions, whose Fidelity is so intirely establish'd in these hitherto equally unaccountable ones.

V. The Obvious, Plain, or Literal Sense of the Sacred Scriptures, ought not, without great Reason, to be eluded or laid aside: Several of those very Places which seem'd very much to require the same hitherto, appearing now to the minutest Circumstances, true and rational, according to the strictest and most Literal Interpretations of them.

VI. We may be under an Obligation to believe such things on the Authority of the Holy Scriptures, as are properly Mysteries; that is, though not really Contradictory, yet plainly Unaccountable to our
(pre-

(present degree of) *Knowledge and Reason*. Thus the Sacred Histories of the Original Constitution, and great Calamities of the World have been in the past Ages the Objects of the Faith of Jews and Christians, though the Divine Providence had not afforded so much Light as that they could otherwise satisfy themselves in the Credibility of them, till the new Improvements in Philosophy. And this is but just and reasonable; for sure the Ignorance or Incapacity of the Creature does by no means afford sufficient Ground for Incredulity, or justify Men in their rejecting Divine Revelation, and impeaching the Veracity or Providence of the Creator.

VII. Seeing the Natural and the Moral World are alike subject to the Divine Providence, and that the same Author has indited those Writings which relate to both; the Discovery of the Verity of the Holy Scriptures in the most difficult Points relating to the one, ought to make us entirely secure of the like Verity of the same Scriptures relating to the other, notwithstanding any Difficulties still remaining about 'em: As the wise, proportionate, and Harmonious Order and Regularity of the Natural World, where no Freedom of the Creature Interposes, and gives any occasion for Disorder, justly obliges us to believe the most wise and equal Methods of Providence to be equally exercised about the Moral one also; although the Intricacies arising from the abuse of the Liberty of Will in Rational Creatures, render them hitherto more obscure to us in the latter Case than in the former: So certainly the Establishment of the Verity of the Scriptures in the most harsh and difficult Assertions touching the Natural World, (the proper Case in which the Improvement of Philosophy

was

was likely to afford means for our Determination) ought to assure us of the like Verity of the same Scriptures in the other Points, more peculiarly the Subjects of Divine Revelation, less capable of affording any other means of Satisfaction, and yet more directly the Design, Scope, and Drift of the Sacred Writers, and the Concern of Divine Providence than the other.

Τῷ δὲ Βασιλεῖ τῶν Ἀιῶνων Ἀρθάρτῳ, Ἀοράτῳ,
Μόνῳ Σοφῷ Θεῷ Τιμὴ καὶ Δόξα εἰς τὴν Ἀῶνα
τῶν Ἀιῶνων. AMHN.

A POST.

A

POSTSCRIPT.

SINCE the finishing of the fore-going *Theory*, I met, a few Days since, with a very good Book just publish'd, call'd, *A Conference with a Theist*; By the Reverend and Learned Dr. *Nichols*; wherein I found him making considerable use of an *Essay* of Sir *William Petty's*, concerning the *Multiplication of Mankind*, and the *Growth of the City of London*; and perceiving thence that *Learned Gentleman* to have there made use of 360 Years, as the Mean or equal Standard for the doubling of Mankind in the present Age; when I had, by Mistake, pitch'd upon 280, from a Book which 'tis suppos'd the same *Author* was concern'd in before, I here-
upon procur'd this latter Book it self, and set
my self to the consideration thereof, and particularly as to what more immediately concern'd my self, and those Calculations I had super-
structed upon a somewhat different *Hypothesis*. By which means I found that this last, and therefore more Authentick *Essay* had not only on very good Grounds fixt 360 Years for the ordinary middle rate of the doubling Mankind with us at present, but had withal remark'd such very different Extrems on either hand sometimes observ'd, and still more different ones ve-
ry

Phenom.
33. prius.

Ibid.

Phenom.
33. cum
70 prius.

ry possible to be observ'd in the World, as gave great Light to several things contain'd in the Holy Scriptures, and particularly to some, insisted on in the foregoing *Theory*, and so was very well worthy of a careful Consideration. Thus it has seem'd very strange to some, that in 215 Years, the 70 Persons descended of *Jacob* shou'd amount to so many as by the Calculation above has been made appear they really did. But now if we consider what Sir *William Petty* proves, that the increase of Mankind has been actually from 120 to 1200 Years in doubling; and may fairly be from 10 to 1200, according to the present Observations; and withal consider that the Lives of Men *then*, generally speaking, were more than six times as long as the middle duration of ours *now*; and so on account of more numerous Posterity, and Co-existence, there is to be about eighteen times as many as the same Number, at the same Rate of Propagation, wou'd produce with us: If, I say, we consider these things, we shall be soon satisfy'd with the Sacred History in this otherwise surprizing Narration, and not at all think it strange that the Children of *Israel* doubl'd themselves in fourteen Years, till the *Exodus* out of *Aegypt*, or the After-Reduction of the Period of Human Life, to the present Standard, before their Entrance into the Land of *Canaan*, seeing 'tis not so incredible as the doubling of any Family or Nation in twenty Years now with us wou'd appear to be; which no one can say to be otherwise than very reasonable, and what does not unfrequently happen in these latter Ages of the World, for many Generations together. But what is more to my present purpose, and the main Occasion of this

Post-

Postscript (besides the rectifying my own mistakes, and that small difference which it has occasion'd in my Calculations, which the Candid Reader will easily pardon and amend) is an Observation I have made on occasion of my lighting upon this last *Essay* of Sir *William Petty*, whereby at once this Matter, of the Multiplication of Mankind in the past Ages, may be in good measure determin'd; and Sir *William's* mistake touching the different Proportions thereof in the different Periods of the World since *Moses's* time, may be corrected, to the great Illustration of the Sacred, as well as Prophane Accounts of the ancient Ages of the World. And the Observation is this, That Mankind, as far as we have means of enquiry, have generally speaking increased in one and the same given Proportion, and doubled themselves in 360 Years in all the past Ages of the World, since the fixing of the present Period of Humane Life. The truth of which Observation I thus prove. 'Tis evident that the most ancient Age of the World, capable of being compar'd with the present, was that of *Moses*, when the Lives of Men were reduc'd to Seventy or Eighty Years, their present Standard; and that therefore the succeeding Period of Four hundred and seventy nine Years, from the *Exodus* out of *Egypt*, till the building of *Solomon's* Temple, was the first considerable enough for our present purpose. 'Tis also evident, That the History of the *Jews*, or the Sacred History, is the only one ancient enough, and certain enough to be introduc'd, and depended on in the present case. Nay, indeed, 'tis evident that the *Jews* from their Union together, and their Distinction

Vid *Phæ.*
nom. 33.
cum 70.
prius.

from the neighbour Nations, as well as the accuracy of their Genealogies and Numbers frequently recorded in Scripture, are alone capable of affording any full and uncontested instances of this Matter. 'Tis, lastly, evident in particular, That the numbers of the Children of *Israel* were exactly taken, and are as exactly recorded at the beginning, and a little before the end of the foremention'd Period, as we shall see presently. So that we have here the fairest opportunity possible of clearing this matter, and of comparing the most ancient, with the latest increase of Mankind; the doing of which will establish the truth of that Observation I am now upon, beyond reasonable contradiction; which I thus attempt. At the *Exodus* of the Children of *Israel* out of *Egypt*, the number of the *men on foot, besides children, was* about *six hundred thousand*. More exactly, a little above a year afterwards, the number of the Males of *Israel* *above twenty years old, all that were able to go forth to war*, were (besides the *Levites*) Six hundred and three thousand, five hundred and fifty. Now the number of the years between these Accounts of the People, and that towards the Conclusion of the Reign of *David*, was about 472 or 473, as Chronologers very well know. Say then, by the Golden Rule, if 360 Years double the People, or produce 1200000, how many, by a proportionable increase, will 473 Years produce? The Product whereof is 1576666; which therefore, according to the foremention'd rate, ought to be the number of the *Israelites* at the time when *David* numbred them 473 Years afterwards. Now the number of the *Israelites* taken by *Joab* was
expresly

Exod xii.

27

Numb. i.

1, 2, 18,

20, 45, 46,

47, 49.

expressly *eight hundred thousand valiant men that drew the Sword*. Besides which, there were twelve Companies of 24000 men a-piece, already numbred and enroll'd, to wait by Turns on the King in the twelve Months of the Year: Which are 288000. So that the Total of the Men of *All Israel* was 1088000, or, in a round number, 1100000 Men, as 'tis expressly in the Book of *Chronicles*. To which add the Men of *Fudab* 470000. or, including, as usual, the small Tribe of *Benjamin*, (which, besides *Levi*, came not into the former Sum:) about 500000. according to the express words of the Book of *Samuel*. And so at last the Total Sum is 1600000, or more nicely 1588000, which is wonderfully near the former sum of 1576666 produc'd by the Arithmetical Calculation above, and highly worthy of our regard and admiration. 'Tis true, the *Israelites* rather decreas'd in the Wilderness; and at the end of the first thirty eight or thirty nine years, (by reason of the cutting off the intire murmuring Generation ere the youngest of them were fifty nine years old) were not quite so many as at the time of their first numbring when they came out of *Egypt*. But then as this will be an excepted case, and the remaining 434 years within a small matter will still answer the assigned Proportion; so indeed this destruction was not greater than ought to be suppos'd oft-times to happen, and such as both has formerly, and does at this day frequently happen in the World; on the allowance of which, the Period of 360 Years was determined: And therefore ought not to be distinctly consider'd in the present case. We may therefore, upon the whole matter, very reasonably

2 Sam.
xxiv. 9.1 Chron.
xxvii. 1.1 Chron.
xxi. 5.
Ibid.
Ibid.2 Sam.
xxiv. 9.Numb.
xxvi. c. 1.
64, 65.

determine, that, excepting what disturbance extraordinary and uncommon Wars, Famines, Plagues, and such other Merciless destroyers of Mankind have given thereto, Mankind have generally increas'd in the same determinate Proportion, and doubled themselves in three hundred and sixty years, for more than three thousand years, from the Time of *Moses*, till the present Age; as was to be prov'd. Which Observation thus establish'd, what Light it might afford *Ancient History*, and the *Holy Scriptures*, as well as the present *Theory*, 'tis not my business here to enquire: But I shall refer the same to the careful Consideration of the Reader.

FINIS.

Books Printed for Benj. Tooke.

C*ursus Mathematicus*: Mathematical Sciences in Nine Books: comprehending Arithmetick, Geometry, Cosmography, Astronomy, Navigation, Trigonometry, with the Description, Construction and Use of Geometrical and Nautical Instruments, and the Doctrine of Triangles applied to Practice in Mensurations of all Kinds. By *William Leybourn*, Philomath. *Fol.*

Fables of *Æsop*, and other Eminent Mythologists, with Morals and Reflections. By *Sir Roger L'Estrange*. *Fol.*

A Catalogue of Books printed in *England* since the dreadful Fire of *London* in 1666. to the end of *Michaelmas* Term 1695. With an Abstract of the General Bills of Mortality since 1660. And the Titles of all the *Classick* Authors, *Cum Notis Variorum*, and those for the use of the *Dauphin*. *Fol.*

Dioptrica Nova: A Treatise of Dioptricks. In Two Parts. Wherein the various Effects and Appearances of Spherick-Glasses, both Convex and Concave, Single and Combined in Telescopes and Microscopes. Together with their Usefulness in many Concerns of Humane Life, are explained. By *William Molyneux* of *Dublin*, Esq; Fellow of the Royal Society. *Quarto.*

Two Sermons preach'd before the Condemn'd Criminals at *Newgate*, 1695. By *B. Crooke*, M. A. Rector of *St. Michael Woodstreet*, *London*. *Quarto.*

A Collection

A Collection of some Papers, writ upon several Occasions, concerning Clipt and Counterfeit Money, and Trade, so far as it relates to the Exportation of Bullion. By Dr. Hugh Chamberlain. Quarto.

Prælectiones Academicæ in Schola Historiæ Camdemiana. Auctore Henrico Dodwello. Octavo.

Two Letters written to a Gentleman of Note, guilty of Common Swearing. To which is added a third Letter to another Gentleman in the Commission of the Peace, exciting him to the Performance of his part in executing the late Act against Profane Cursing and Swearing. Twelves.

ERRATA.

P *Ag. 1. lin. 4. read agreeably. p. 5. l. 11. r. World. p. 7. l. 5. r. are.*
p. 10. l. 24. r. denotes. p. 24. l. 5. r. had. p. 33. l. 4. r. Phæno-
mena. p. 47. l. 16. r. direct. p. 56. l. 3. r. scarce. p. 77. l. 15. r. re-
ceding. p. 89. l. 20. dele and. p. 31. l. 10. r. 1 year 322 days l. 11.
12 years or more nicely 4332 days. l. 12. 30 years more nice-
ly 10759 days. p. 34. l. 2. r. are. p. 66. l. 29. at the end add
[will be I suppose] p. 93. l. 32. r. Hypothesis. p. 101. l. 5.
must have been. p. 138. l. 2. r. But if that were as. p. 142. l. 23.
r. months [immediately succeeding one another.] p. 149. l. 10.
r. demonstrate. p. 159. l. 5. r. were. p. 175. Tit. r. Phænomena.
p. 176. l. penult. marg. r. 104. p. 211. l. 1. r. Atmosphere. p. 221.
l. 23. r. with the course, &c. p. 225. l. 29. r. seem. p. 230. l. 17.
after [and] add [that Account]. p. 231. marg. r. Hypoth. 1.
p. 234. l. 23. r. Hexaameron. p. 236. l. 27. r. And lighter
Earthy. p. 246, & 252. r. ἰαυε. p. 252. l. 6. r. nor. p. 290. l. 25.
r. Heat in p. 300. l. 1. r. Agitations.
